FIG. 1 (PRIOR ART)

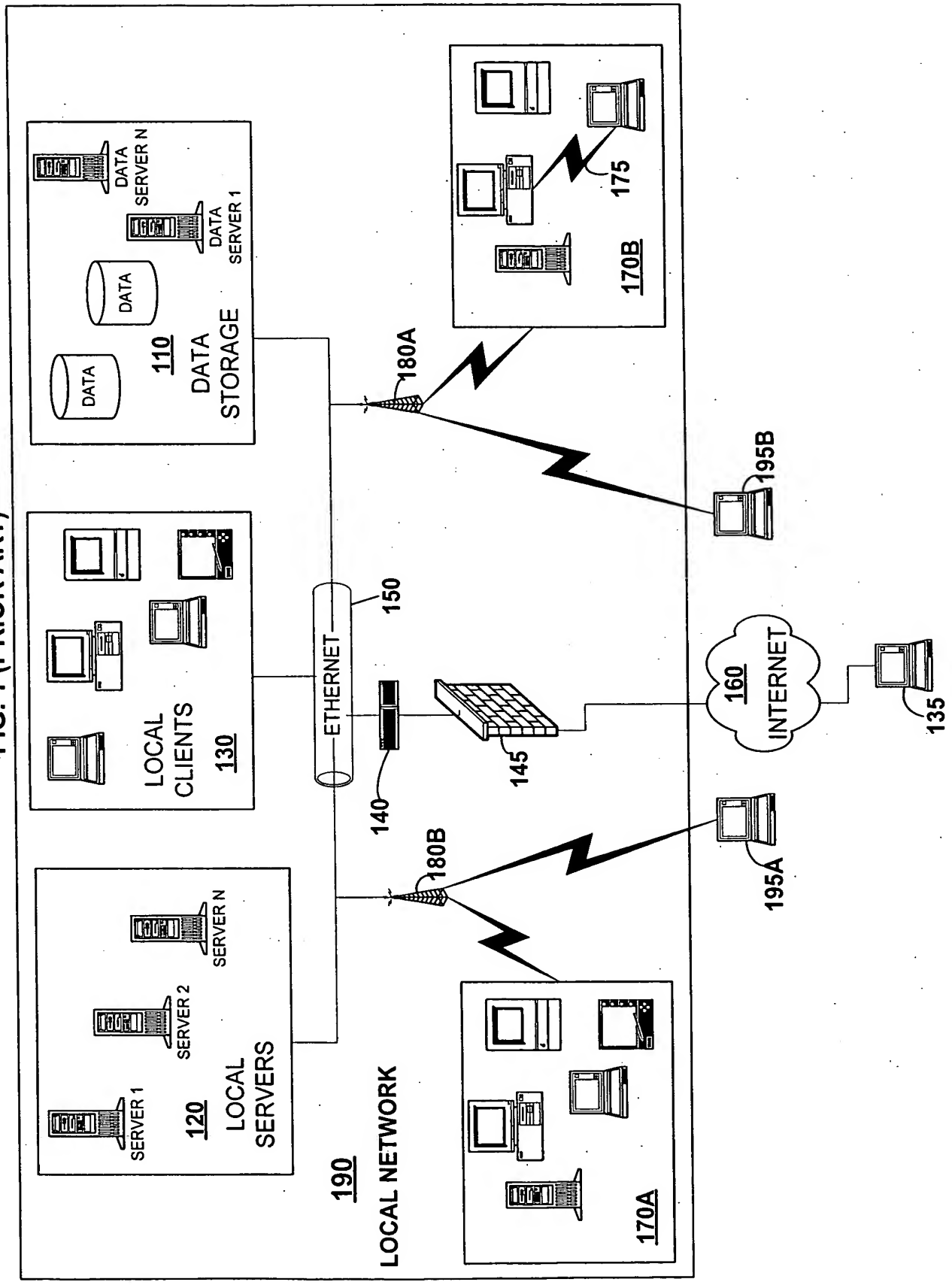
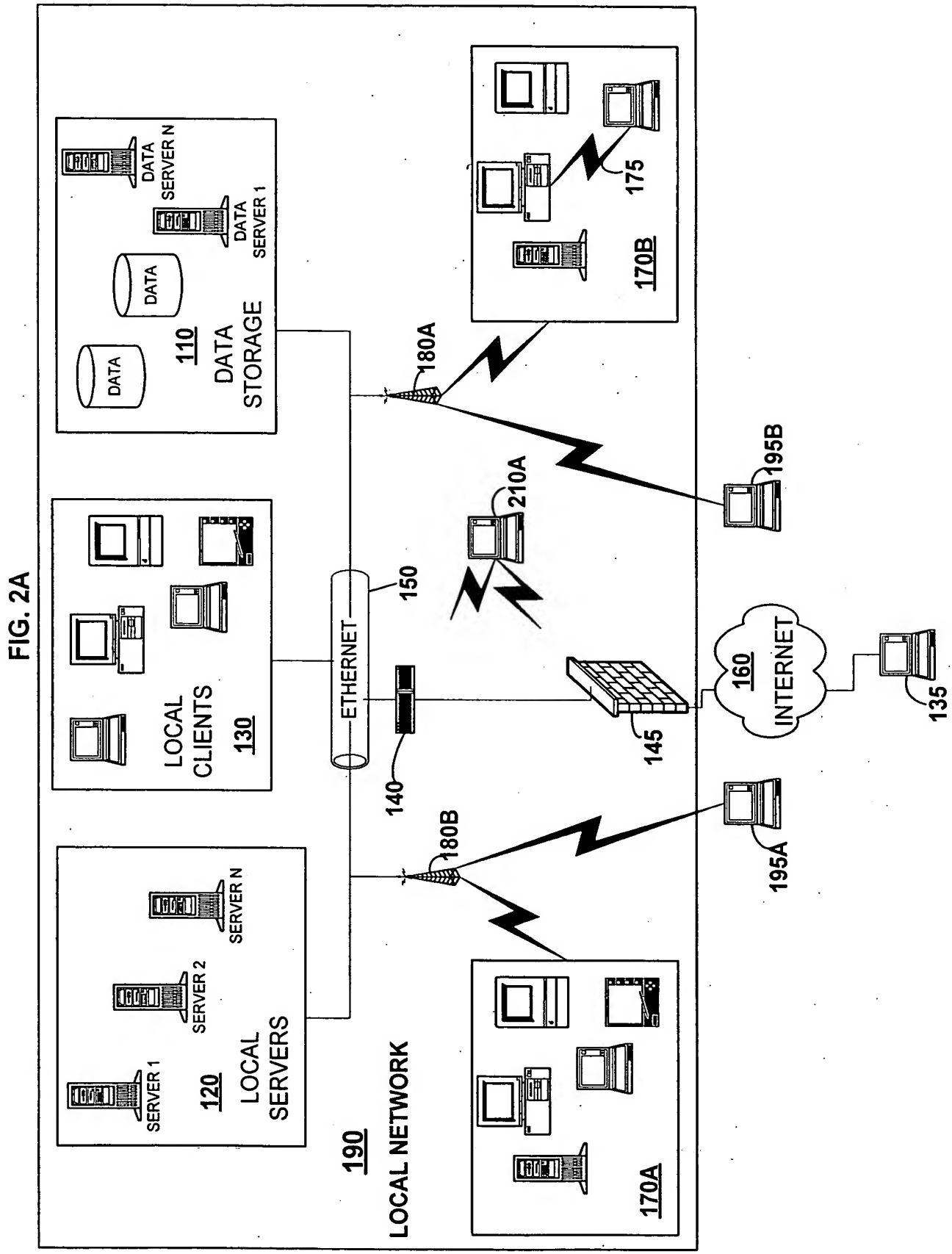


FIG. 2A


LOCAL NETWORK
190
DATA STORAGE
110
DATA SERVER N
DATA SERVER 1
DATA
DATA
LOCAL CLIENTS
130
LOCAL SERVERS
120
SERVER 1
SERVER 2
SERVER N
ETHERNET
150
140
145
INTERNET
160
135
170A
170B
175
180A
180B
195A
195B
210A

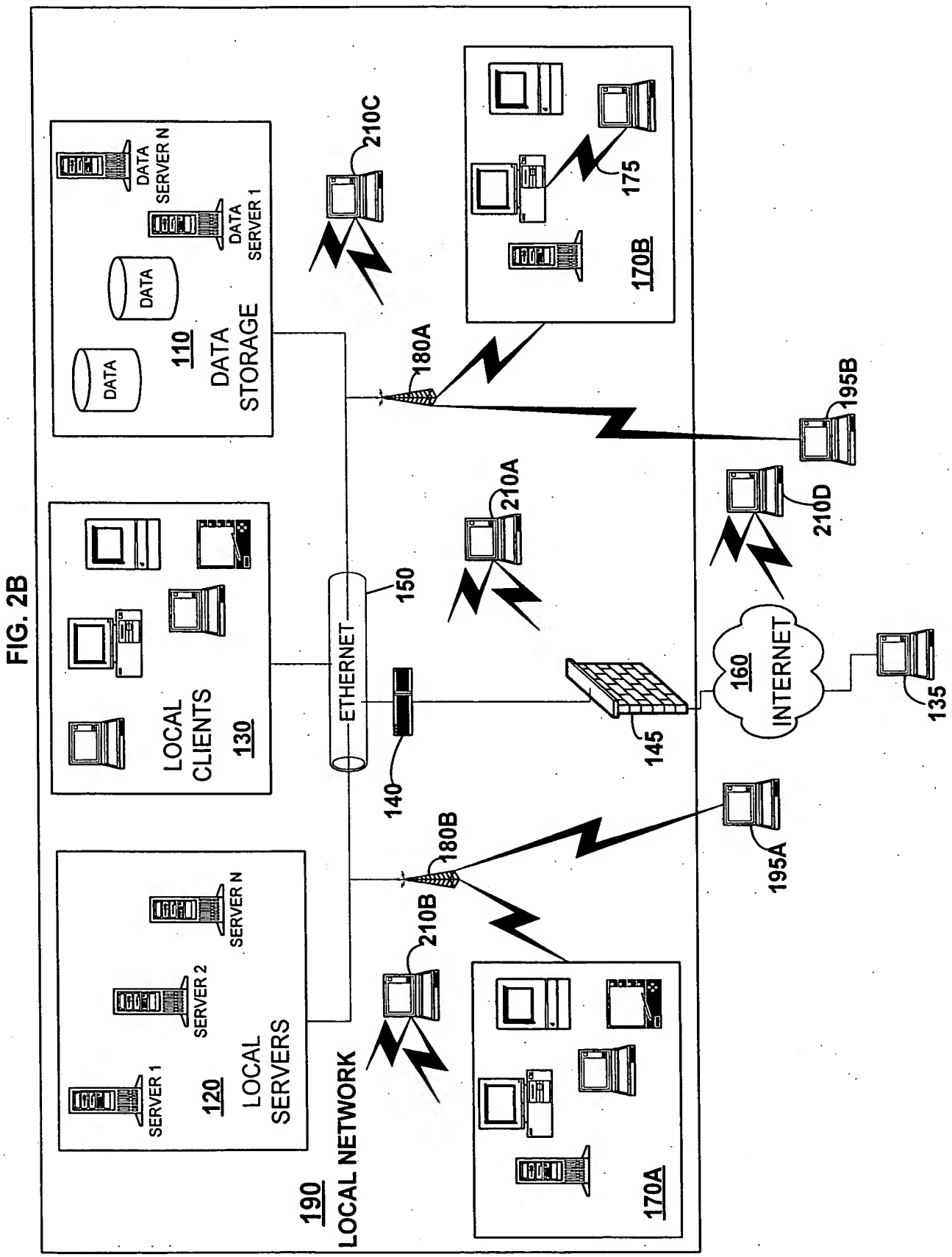
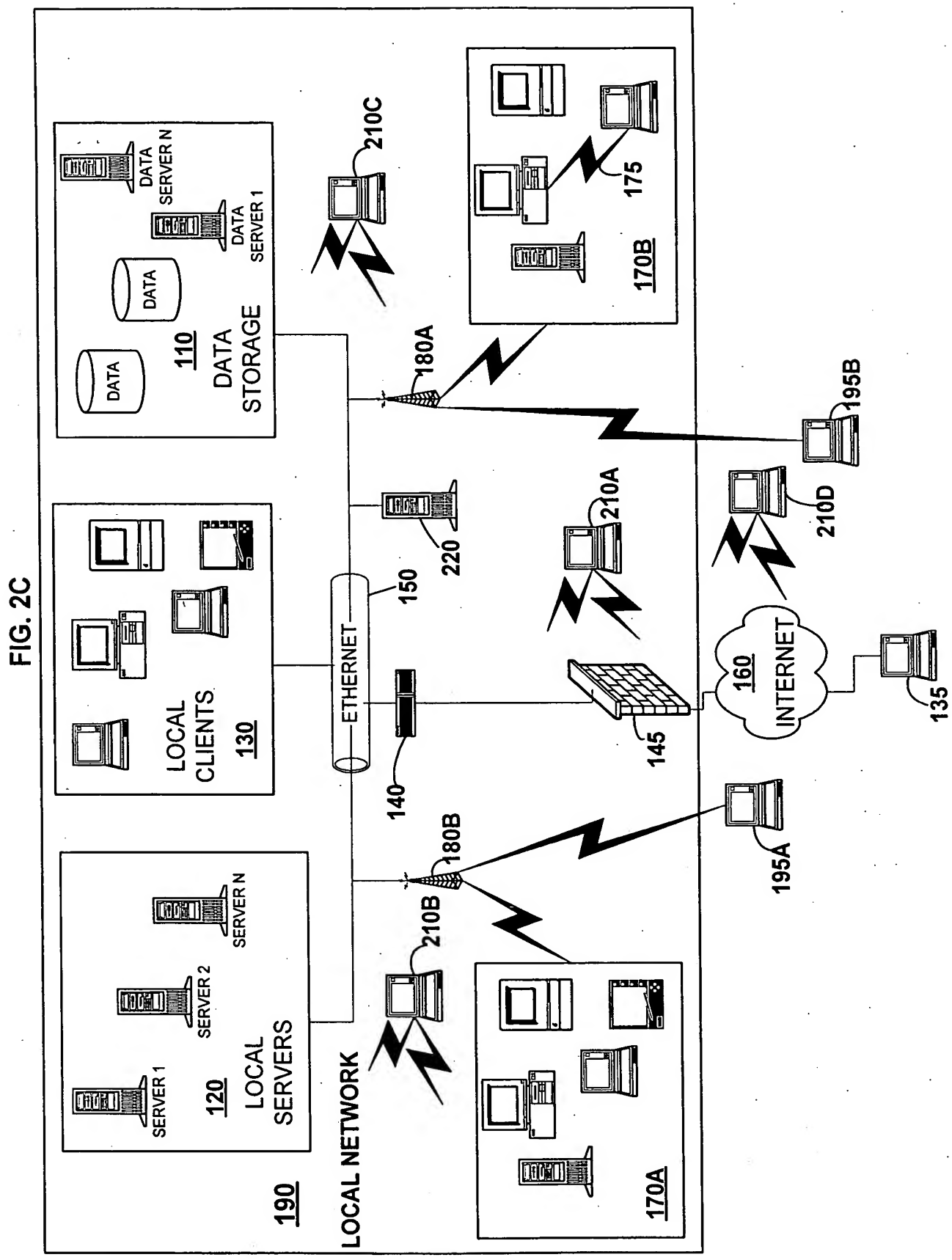

190
LOCAL NETWORK
110
DATA STORAGE
DATA
DATA
DATA SERVER N
DATA SERVER 1
120
LOCAL SERVERS
SERVER 1
SERVER 2
SERVER N
130
LOCAL CLIENTS
140
ETHERNET
150
145
160
INTERNET
135
170A
170B
175
180A
180B
195A
195B
210A
210B
210C
210D

FIG. 2B

FIG. 2C


DATA SERVER N
DATA SERVER 1
DATA
DATA
110
DATA STORAGE
210C
175
170B
180A
195B
210D
210A
220
150
ETHERNET
LOCAL CLIENTS
130
140
145
160
INTERNET
135
195A
180B
210B
SERVER N
SERVER 2
SERVER 1
120
LOCAL SERVERS
190
LOCAL NETWORK
170A

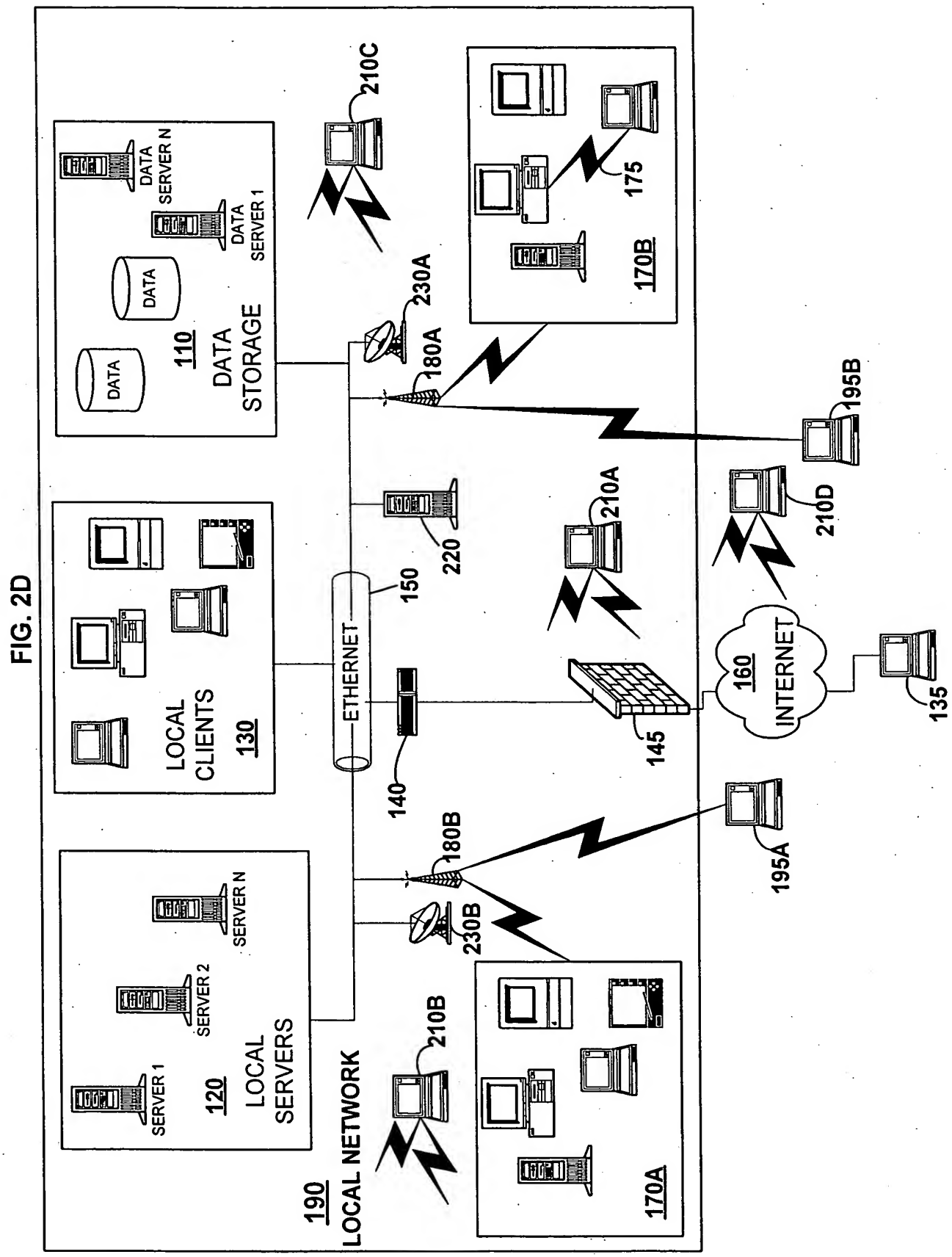

190
LOCAL NETWORK
DATA STORAGE
110
DATA
DATA
DATA
SERVER N
DATA
SERVER 1
LOCAL CLIENTS
130
LOCAL SERVERS
120
SERVER 1
SERVER 2
SERVER N
ETHERNET
150
140
220
230A
230B
180A
180B
210A
210B
210C
210D
170A
170B
175
145
160
INTERNET
135
195A
195B

FIG. 2D

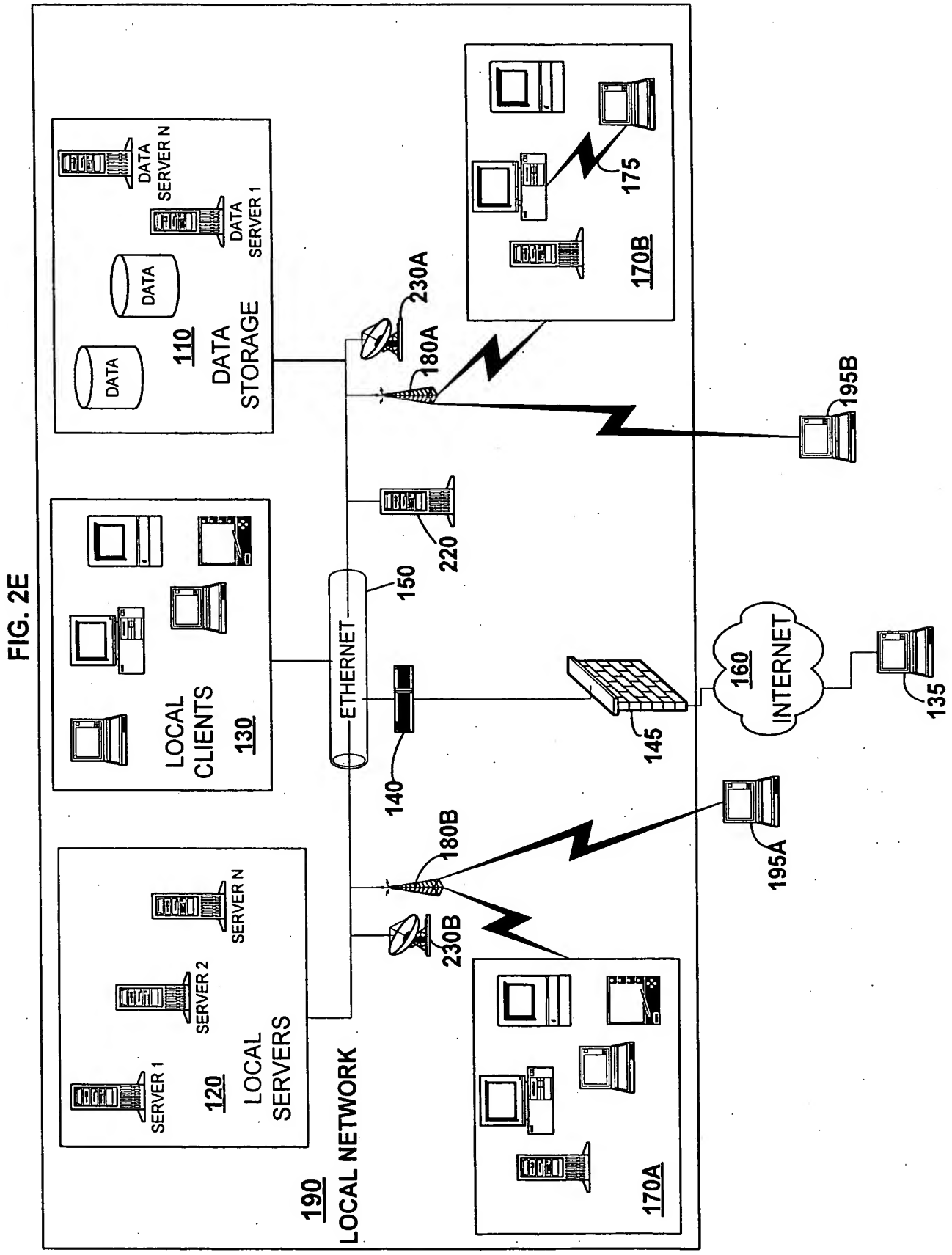

DATA SERVER N
DATA SERVER 1
DATA
DATA
110 DATA STORAGE
230A
180A
170B
175
195B
220
150
ETHERNET
LOCAL CLIENTS 130
140
145
160 INTERNET
135
180B
230B
195A
SERVER N
SERVER 2
SERVER 1
120 LOCAL SERVERS
190 LOCAL NETWORK
170A

FIG. 2E

FIG. 3

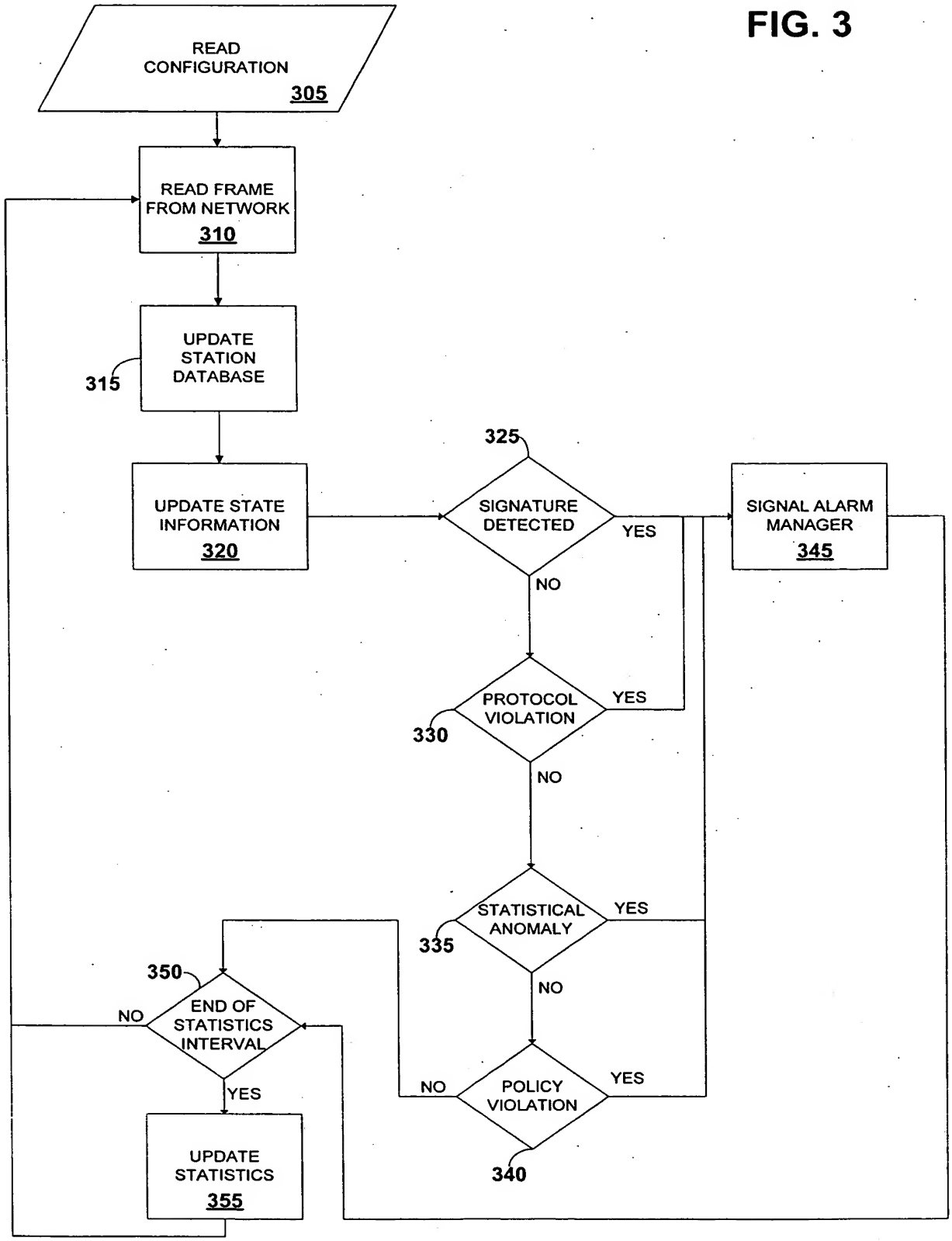

READ CONFIGURATION
305
READ FRAME FROM NETWORK
310
UPDATE STATION DATABASE
315
UPDATE STATE INFORMATION
320
325
SIGNATURE DETECTED
YES
NO
SIGNAL ALARM MANAGER
345
PROTOCOL VIOLATION
330
YES
NO
STATISTICAL ANOMALY
335
YES
NO
POLICY VIOLATION
340
YES
NO
350
END OF STATISTICS INTERVAL
NO
YES
UPDATE STATISTICS
355

FIG. 4

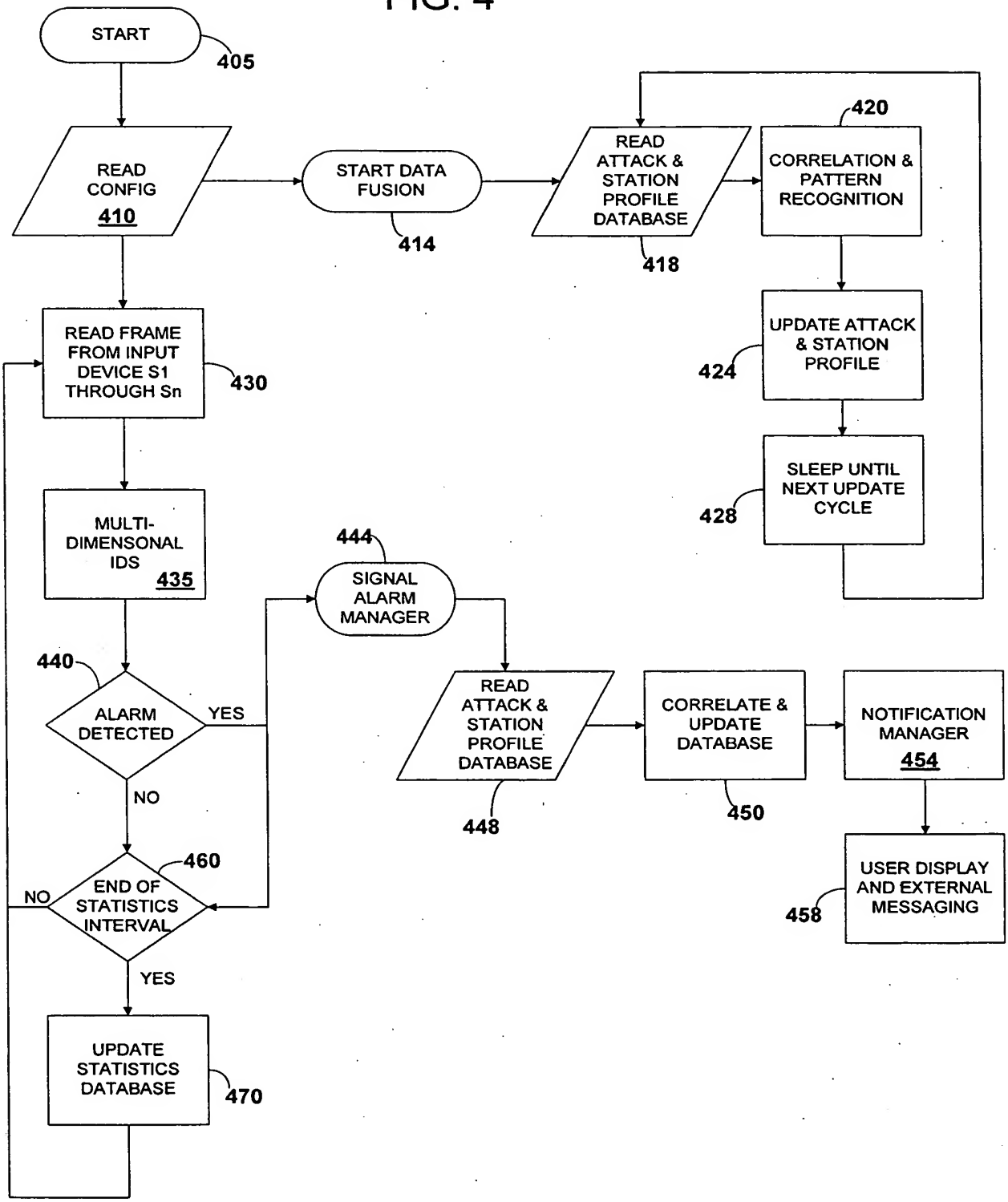

START
405
READ CONFIG
410
START DATA FUSION
414
READ ATTACK & STATION PROFILE DATABASE
418
420
CORRELATION & PATTERN RECOGNITION
UPDATE ATTACK & STATION PROFILE
424
SLEEP UNTIL NEXT UPDATE CYCLE
428
READ FRAME FROM INPUT DEVICE S1 THROUGH Sn
430
MULTI-DIMENSONAL IDS
435
444
SIGNAL ALARM MANAGER
440
ALARM DETECTED
YES
NO
READ ATTACK & STATION PROFILE DATABASE
448
CORRELATE & UPDATE DATABASE
450
NOTIFICATION MANAGER
454
USER DISPLAY AND EXTERNAL MESSAGING
458
460
END OF STATISTICS INTERVAL
NO
YES
UPDATE STATISTICS DATABASE
470

FIG. 5

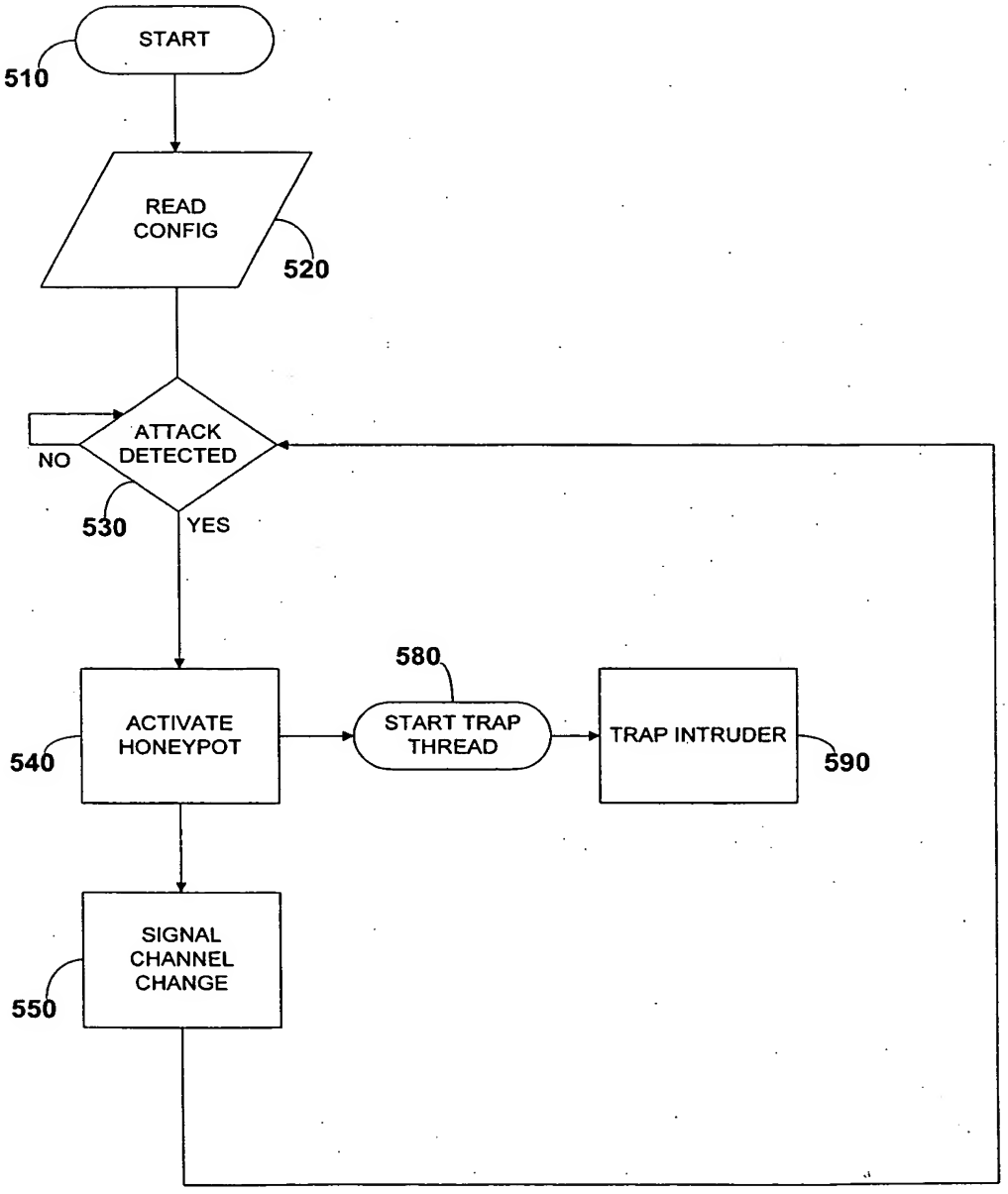

START
510
READ CONFIG
520
ATTACK DETECTED
NO
530
YES
580
ACTIVATE HONEYPOT
540
START TRAP THREAD
TRAP INTRUDER
590
SIGNAL CHANNEL CHANGE
550

FIG. 6A

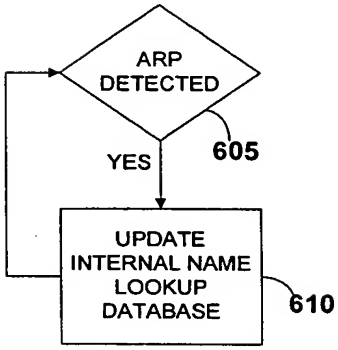

ARP DETECTED
605
YES
UPDATE INTERNAL NAME LOOKUP DATABASE
610

FIG. 6B

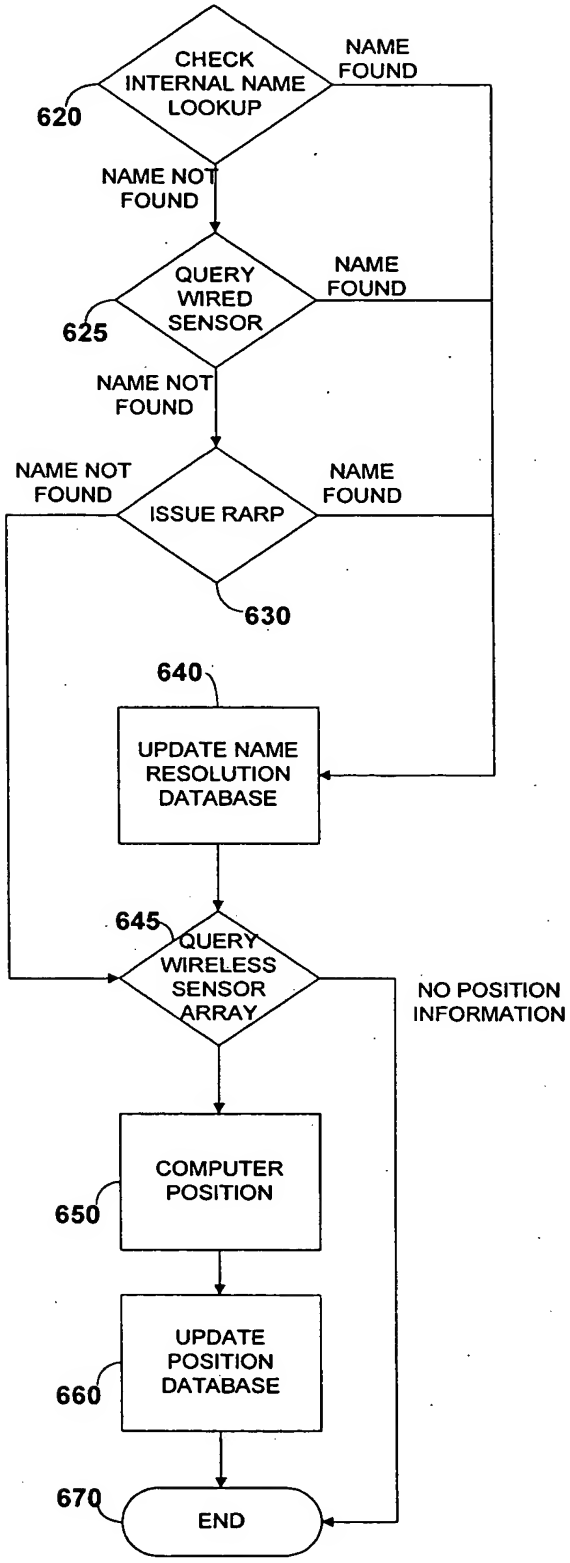

CHECK INTERNAL NAME LOOKUP
620
NAME FOUND
NAME NOT FOUND
QUERY WIRED SENSOR
625
NAME FOUND
NAME NOT FOUND
ISSUE RARP
NAME NOT FOUND
NAME FOUND
630
640
UPDATE NAME RESOLUTION DATABASE
645
QUERY WIRELESS SENSOR ARRAY
NO POSITION INFORMATION
COMPUTER POSITION
650
UPDATE POSITION DATABASE
660
670
END

FIG. 7A

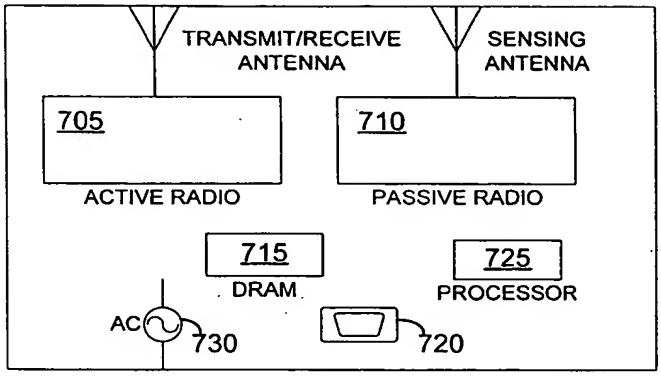


FIG. 7B

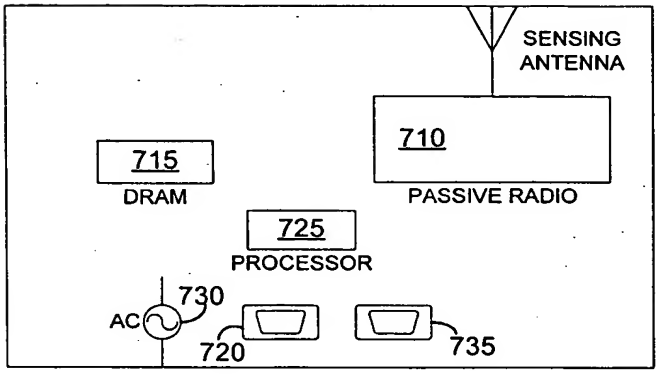


FIG. 7C

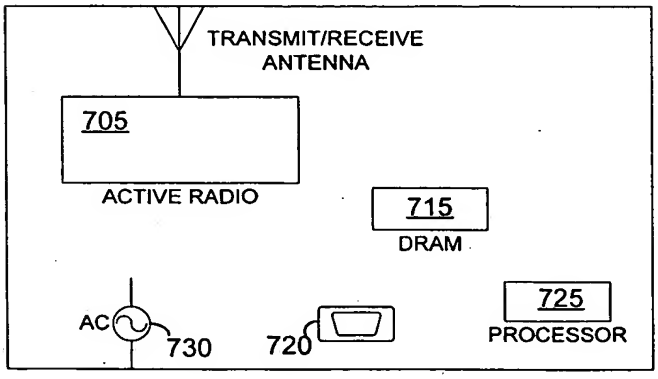


FIG 8A

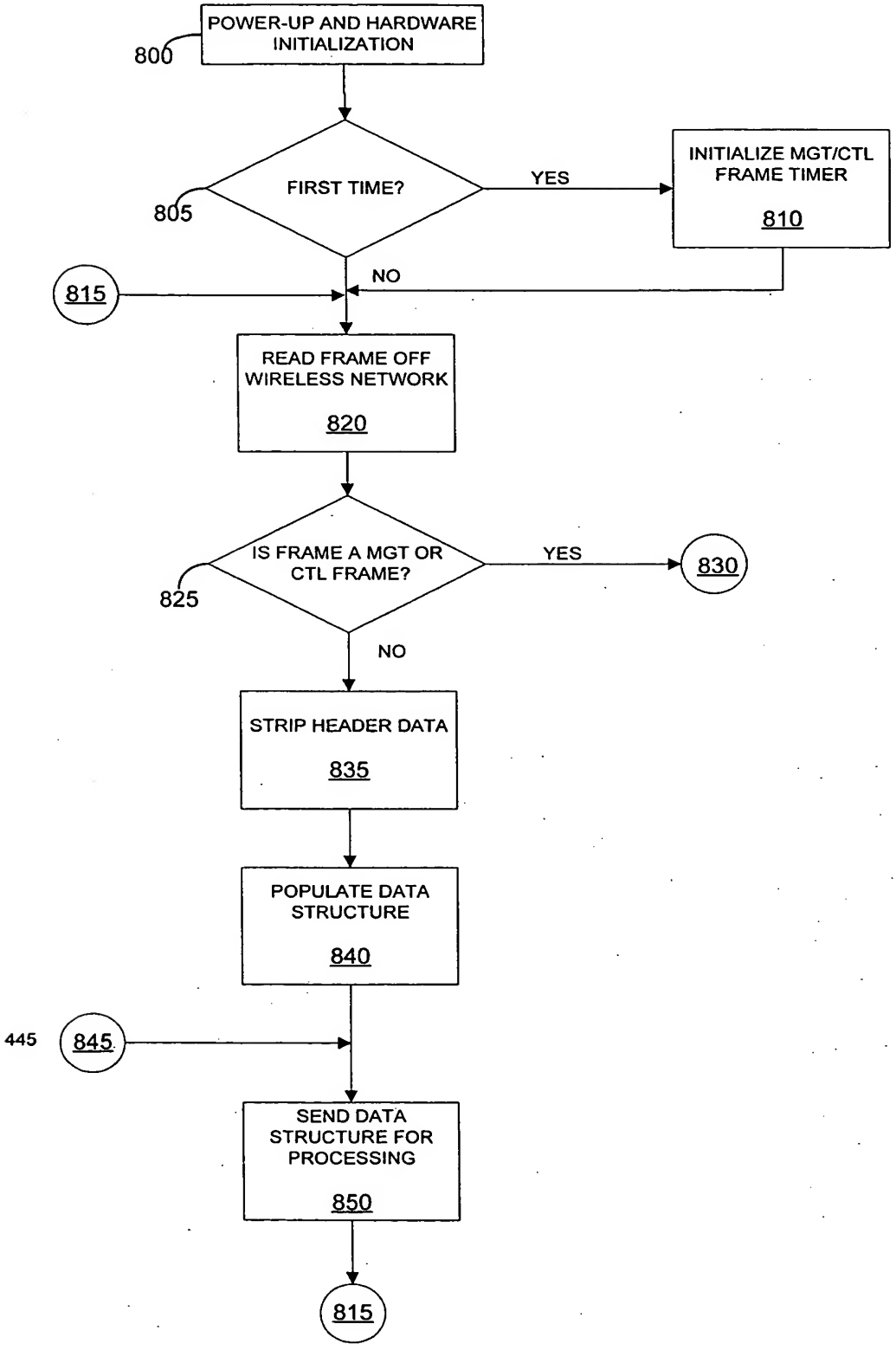

POWER-UP AND HARDWARE INITIALIZATION
800
FIRST TIME?
805
YES
INITIALIZE MGT/CTL FRAME TIMER
810
NO
815
READ FRAME OFF WIRELESS NETWORK
820
IS FRAME A MGT OR CTL FRAME?
825
YES
830
NO
STRIP HEADER DATA
835
POPULATE DATA STRUCTURE
840
445
845
SEND DATA STRUCTURE FOR PROCESSING
850
815

FIG 8B

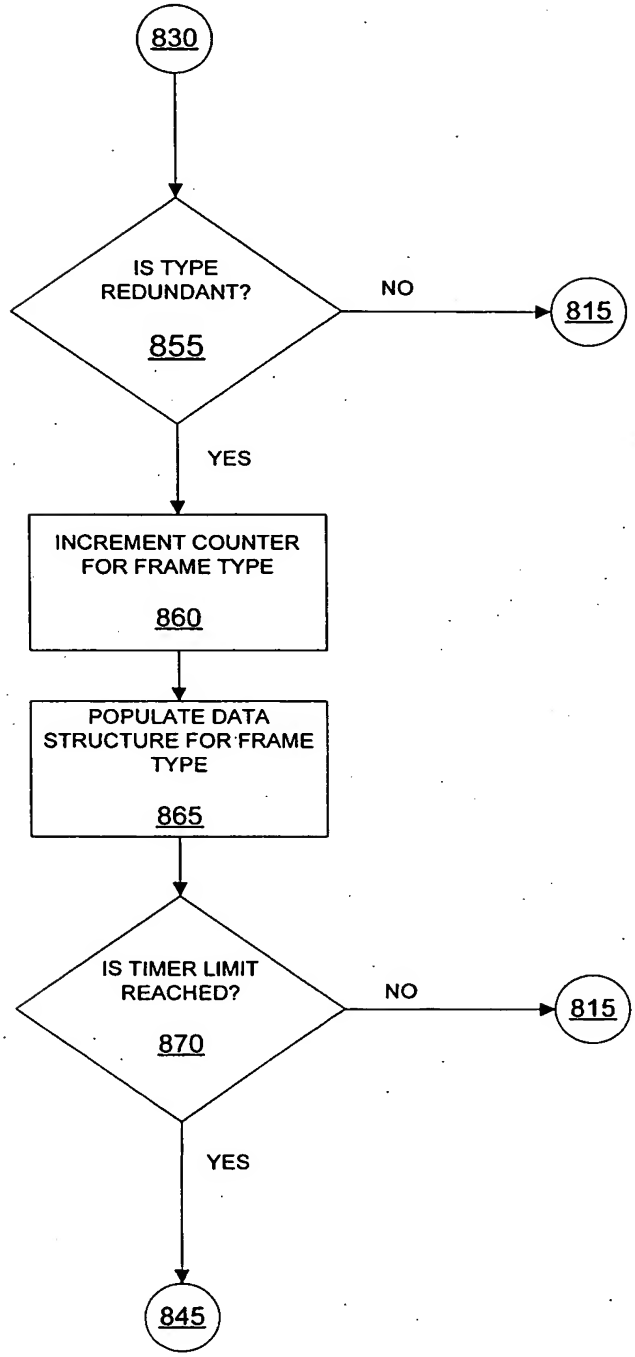

830
IS TYPE REDUNDANT?
855
NO
815
YES
INCREMENT COUNTER FOR FRAME TYPE
860
POPULATE DATA STRUCTURE FOR FRAME TYPE
865
IS TIMER LIMIT REACHED?
870
NO
815
YES
845

FIG. 9

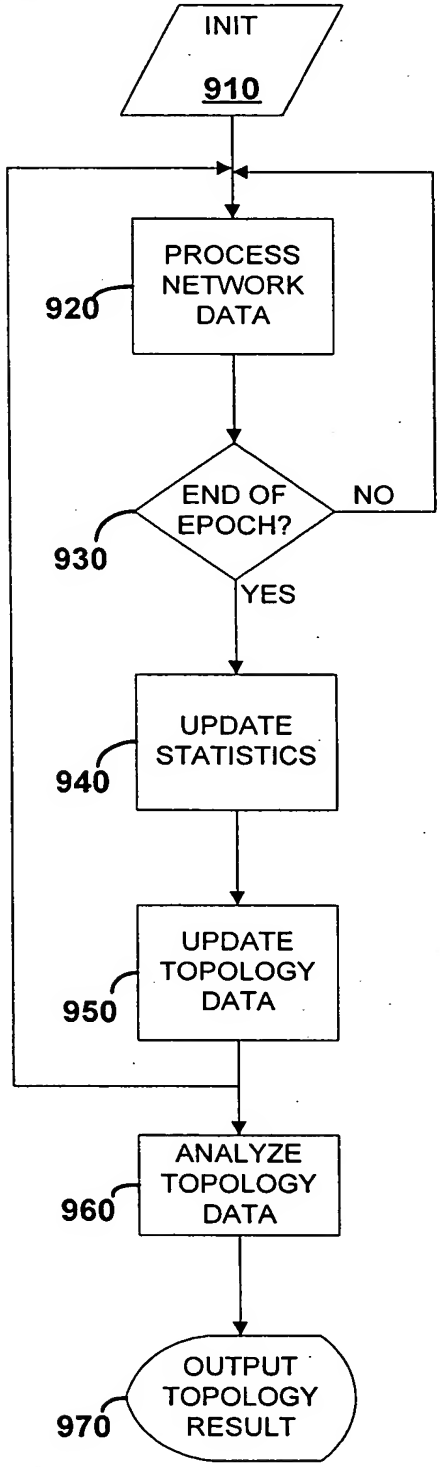

INIT
910
PROCESS NETWORK DATA
920
END OF EPOCH?
930
NO
YES
UPDATE STATISTICS
940
UPDATE TOPOLOGY DATA
950
ANALYZE TOPOLOGY DATA
960
OUTPUT TOPOLOGY RESULT
970

FIG. 10

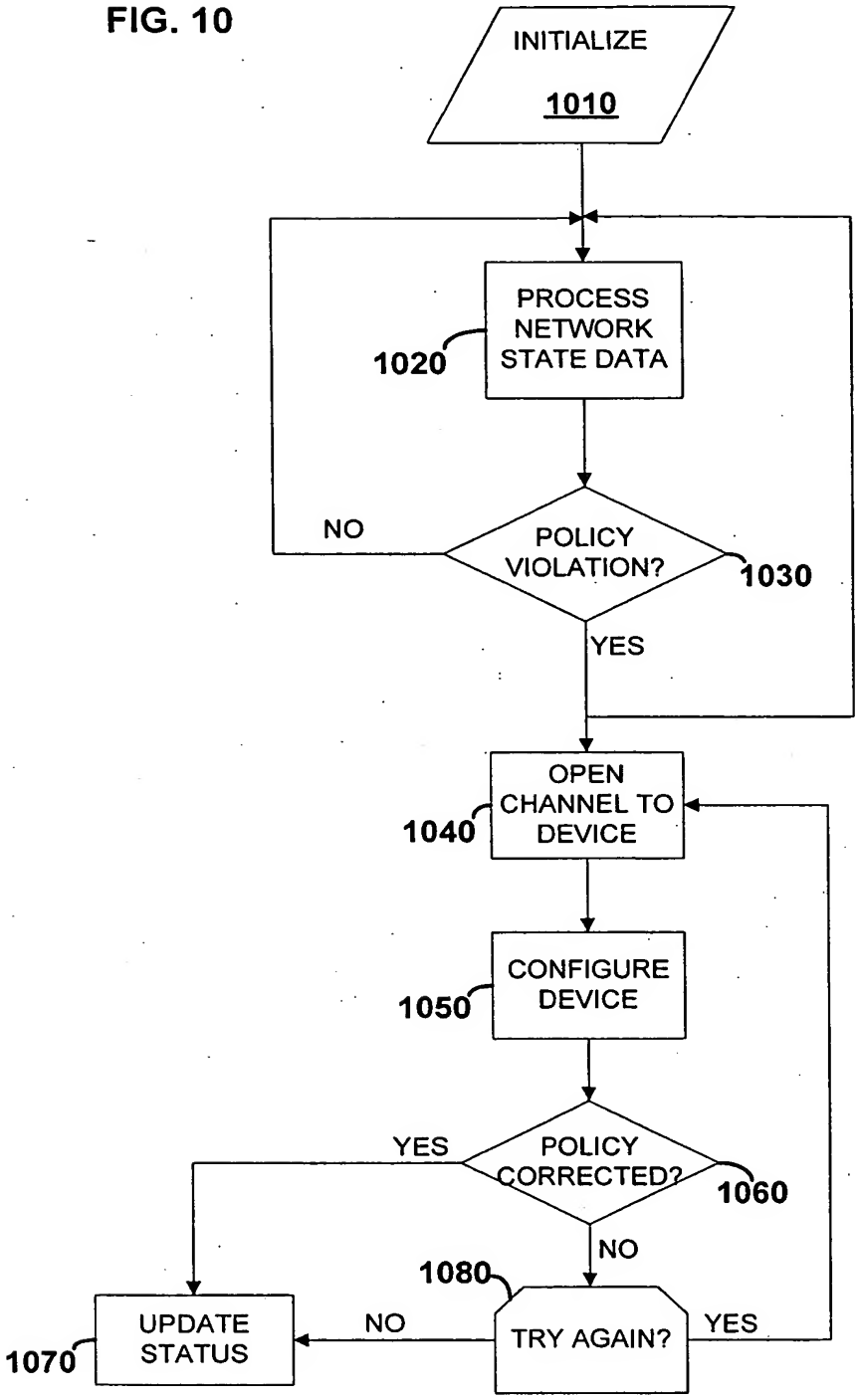
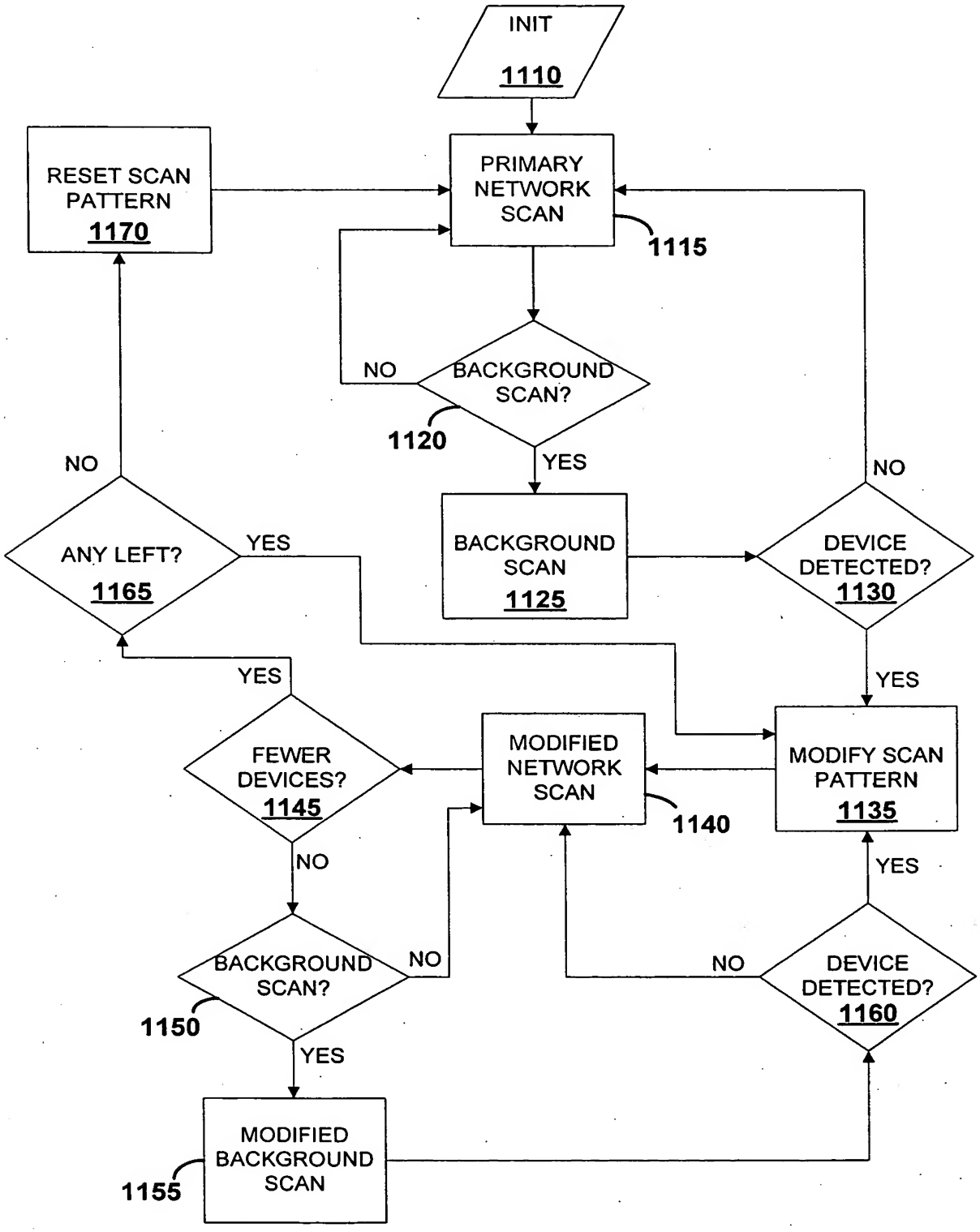

INITIALIZE
1010
PROCESS NETWORK STATE DATA
1020
NO
POLICY VIOLATION?
1030
YES
OPEN CHANNEL TO DEVICE
1040
CONFIGURE DEVICE
1050
YES
POLICY CORRECTED?
1060
NO
1080
UPDATE STATUS
1070
NO
TRY AGAIN?
YES

FIG. 11


INIT
1110
RESET SCAN PATTERN
1170
PRIMARY NETWORK SCAN
1115
NO
BACKGROUND SCAN?
1120
YES
NO
ANY LEFT?
1165
YES
BACKGROUND SCAN
1125
DEVICE DETECTED?
1130
NO
YES
YES
FEWER DEVICES?
1145
MODIFIED NETWORK SCAN
1140
MODIFY SCAN PATTERN
1135
NO
YES
BACKGROUND SCAN?
1150
NO
NO
DEVICE DETECTED?
1160
YES
MODIFIED BACKGROUND SCAN
1155

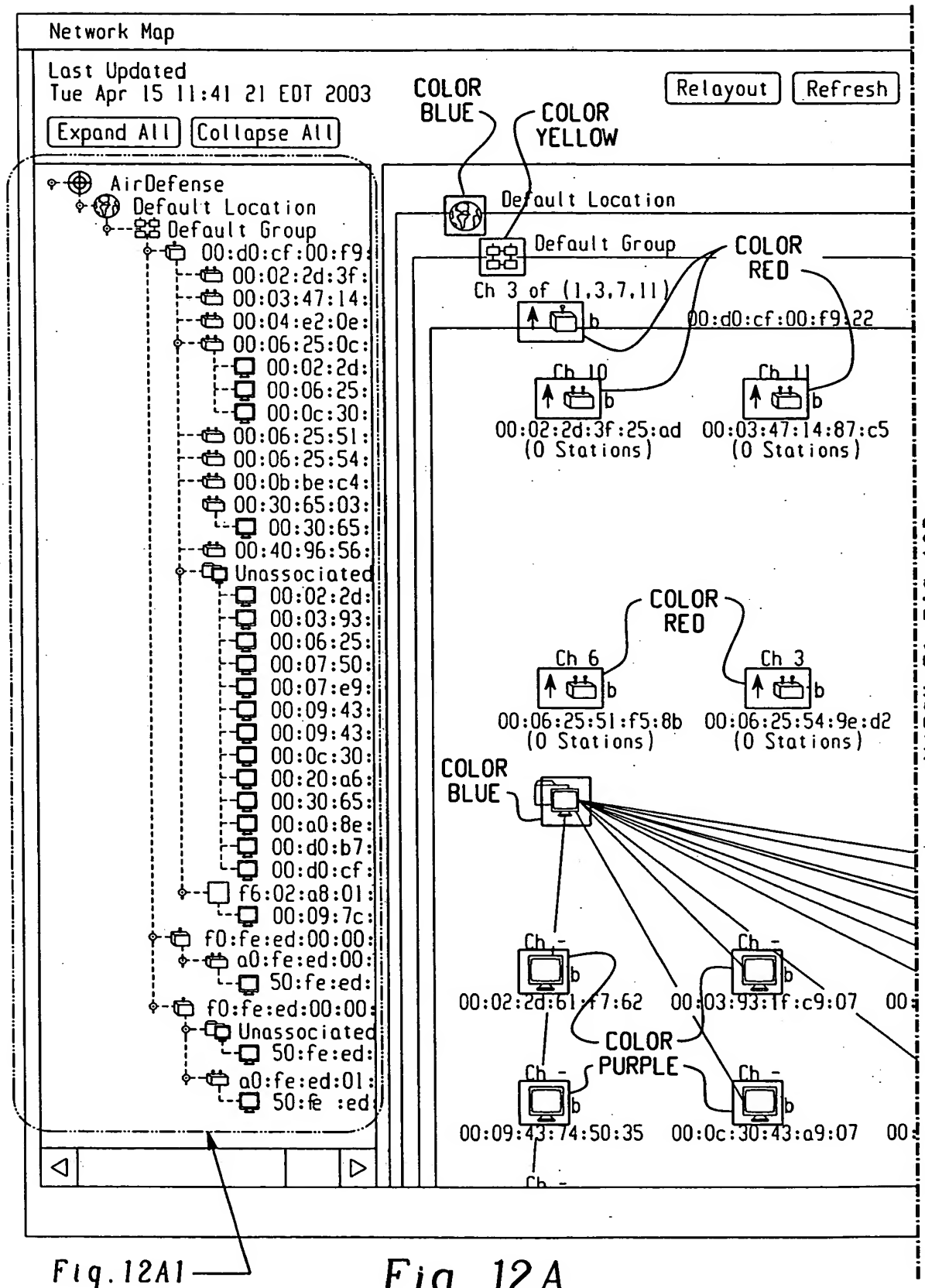


Fig. 12A1

Fig. 12A

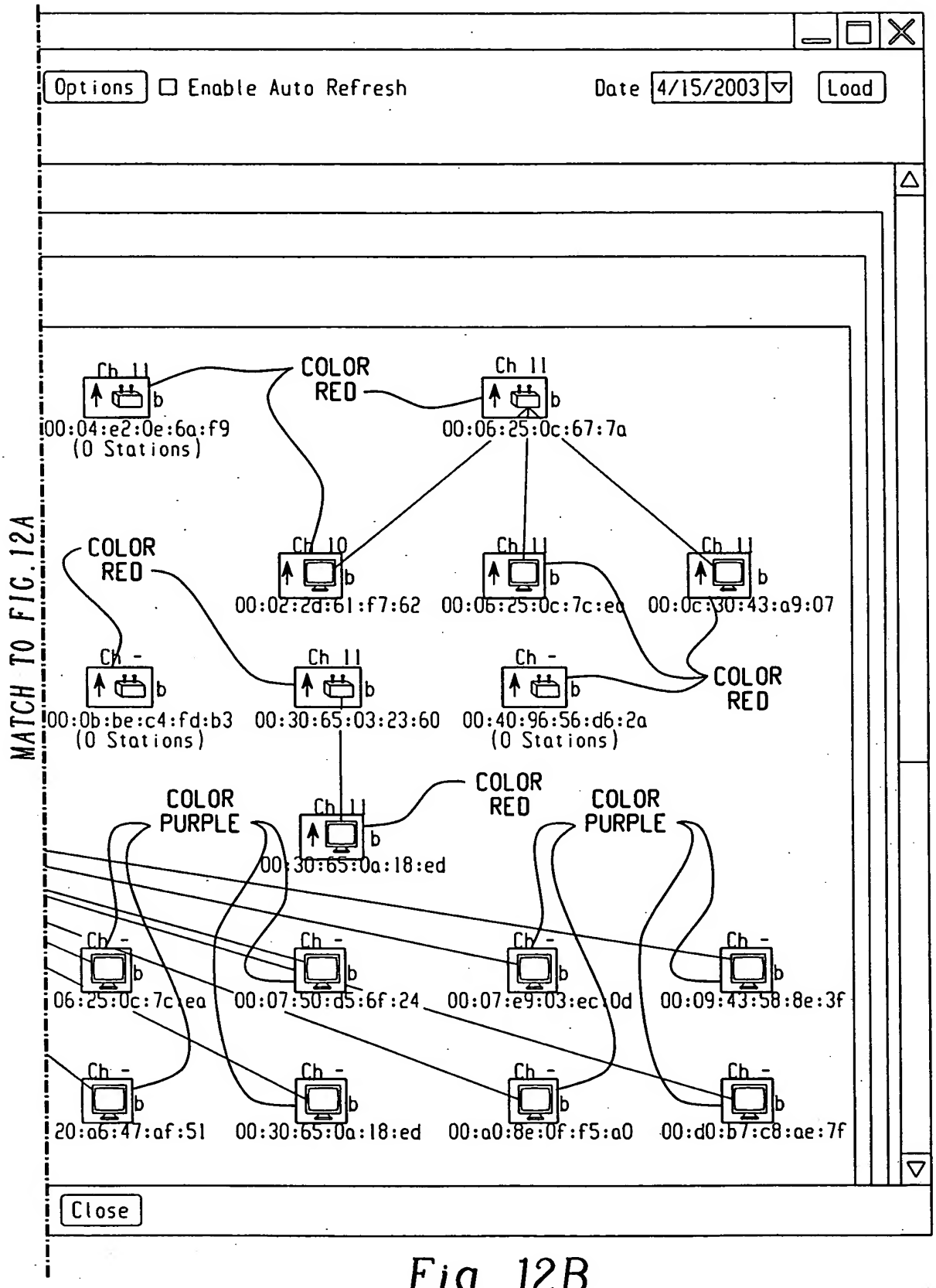

Options
Enable Auto Refresh
Date 4/15/2003
Load
MATCH TO FIG. 12A
Ch 11
00:04:e2:0e:6a:f9
(0 Stations)
COLOR RED
Ch 11
00:06:25:0c:67:7a
COLOR RED
Ch 10
00:02:2d:61:f7:62
Ch 11
00:06:25:0c:7c:ea
Ch 11
00:0c:30:43:a9:07
Ch -
00:0b:be:c4:fd:b3
(0 Stations)
Ch 11
00:30:65:03:23:60
Ch -
00:40:96:56:d6:2a
(0 Stations)
COLOR RED
COLOR PURPLE
Ch 11
00:30:65:0a:18:ed
COLOR RED
COLOR PURPLE
Ch -
06:25:0c:7c:ea
Ch -
00:07:50:d5:6f:24
Ch -
00:07:e9:03:ec:0d
Ch -
00:09:43:58:8e:3f
Ch -
20:a6:47:af:51
Ch -
00:30:65:0a:18:ed
Ch -
00:a0:8e:0f:f5:a0
Ch -
00:d0:b7:c8:ae:7f
Close

Fig. 12B

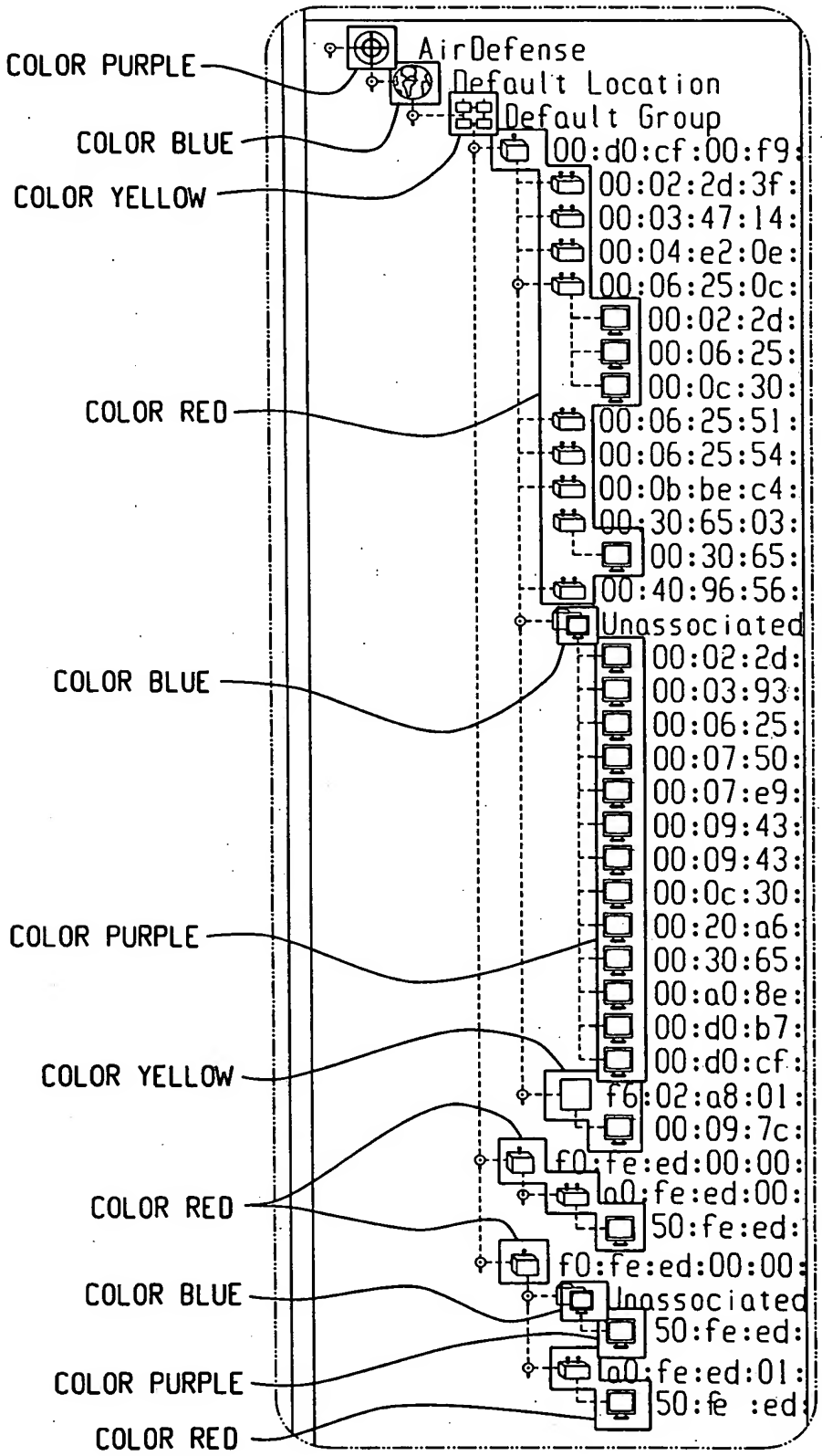

COLOR PURPLE
COLOR BLUE
COLOR YELLOW
COLOR RED
COLOR BLUE
COLOR PURPLE
COLOR YELLOW
COLOR RED
COLOR BLUE
COLOR PURPLE
COLOR RED
AirDefense
Default Location
Default Group
00:d0:cf:00:f9:
00:02:2d:3f:
00:03:47:14:
00:04:e2:0e:
00:06:25:0c:
00:02:2d:
00:06:25:
00:0c:30:
00:06:25:51:
00:06:25:54:
00:0b:be:c4:
00:30:65:03:
00:30:65:
00:40:96:56:
Unassociated
00:02:2d:
00:03:93:
00:06:25:
00:07:50:
00:07:e9:
00:09:43:
00:09:43:
00:0c:30:
00:20:a6:
00:30:65:
00:a0:8e:
00:d0:b7:
00:d0:cf:
f6:02:a8:01:
00:09:7c:
f0:fe:ed:00:00:
a0:fe:ed:00:
50:fe:ed:
f0:fe:ed:00:00:
Unassociated
50:fe:ed:
a0:fe:ed:01:
50:fe:ed:

Fig. 12A1

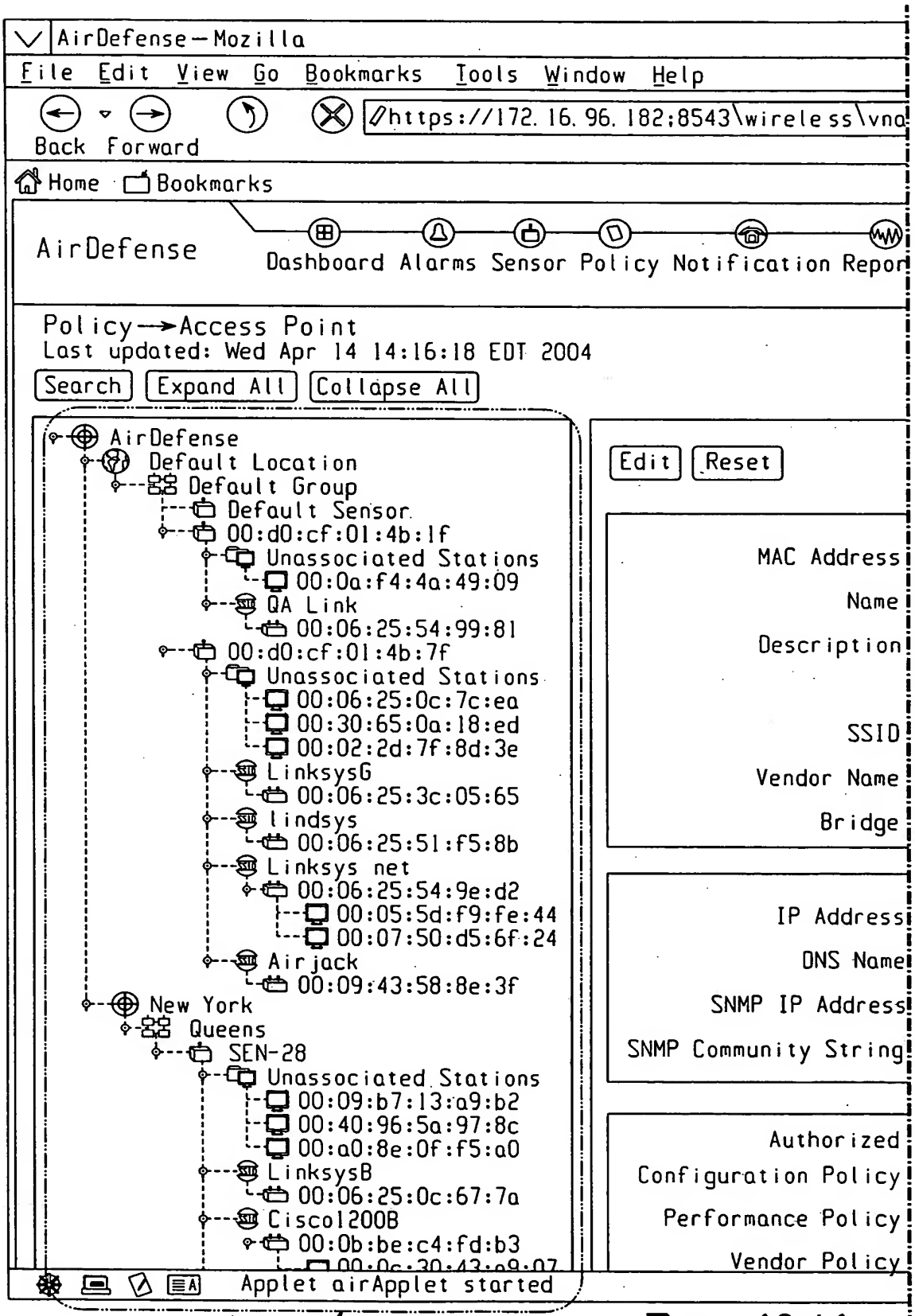


Fig. 13A1a

Fig. 13A1

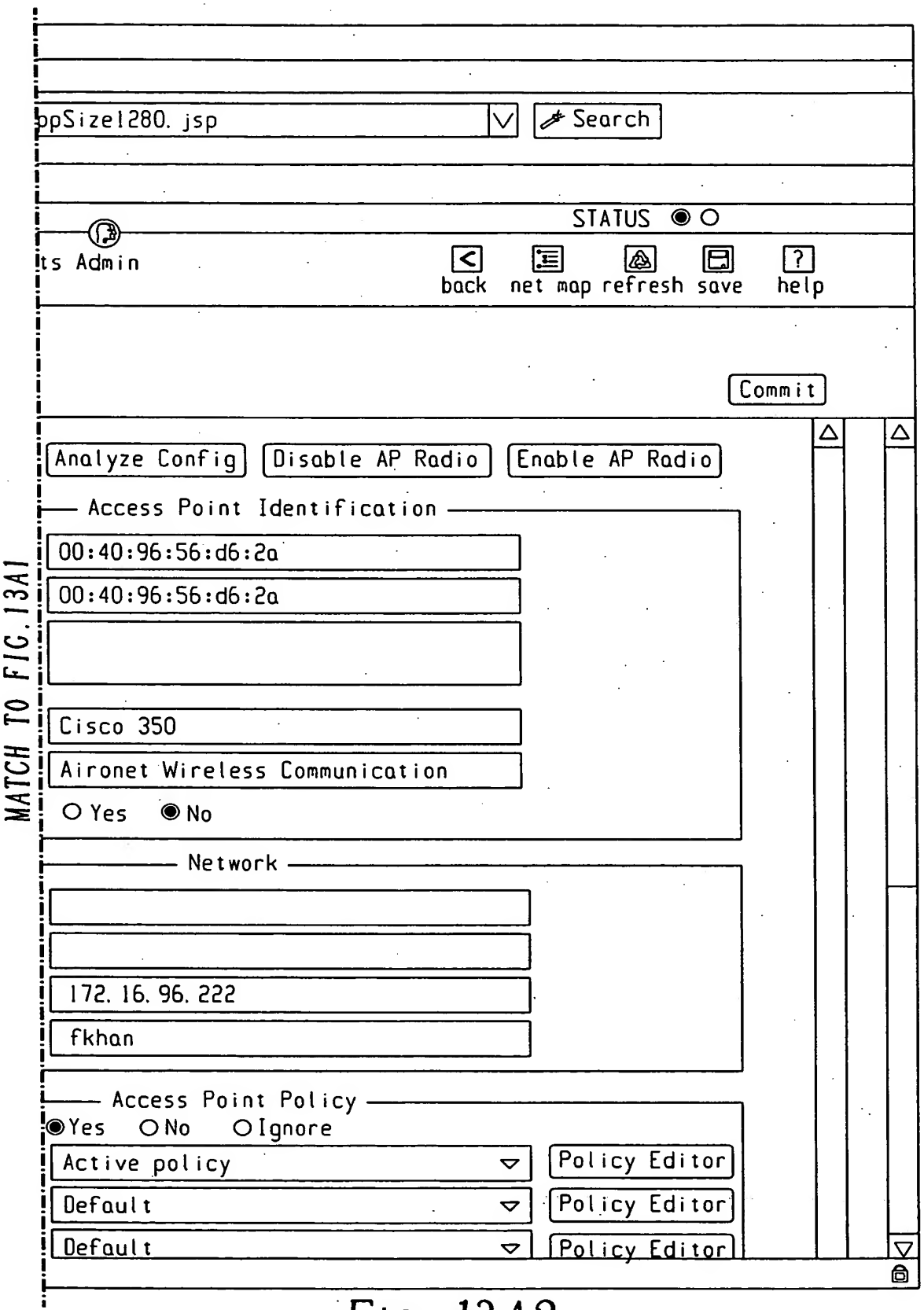

ppSize1280. jsp
Search
STATUS
ts Admin
back
net map
refresh
save
help
Commit
Analyze Config
Disable AP Radio
Enable AP Radio
Access Point Identification
00:40:96:56:d6:2a
00:40:96:56:d6:2a
Cisco 350
Aironet Wireless Communication
Yes
No
Network
172. 16. 96. 222
fkhan
Access Point Policy
Yes
No
Ignore
Active policy
Default
Default
Policy Editor
Policy Editor
Policy Editor
MATCH TO FIG. 13A1

Fig. 13A2

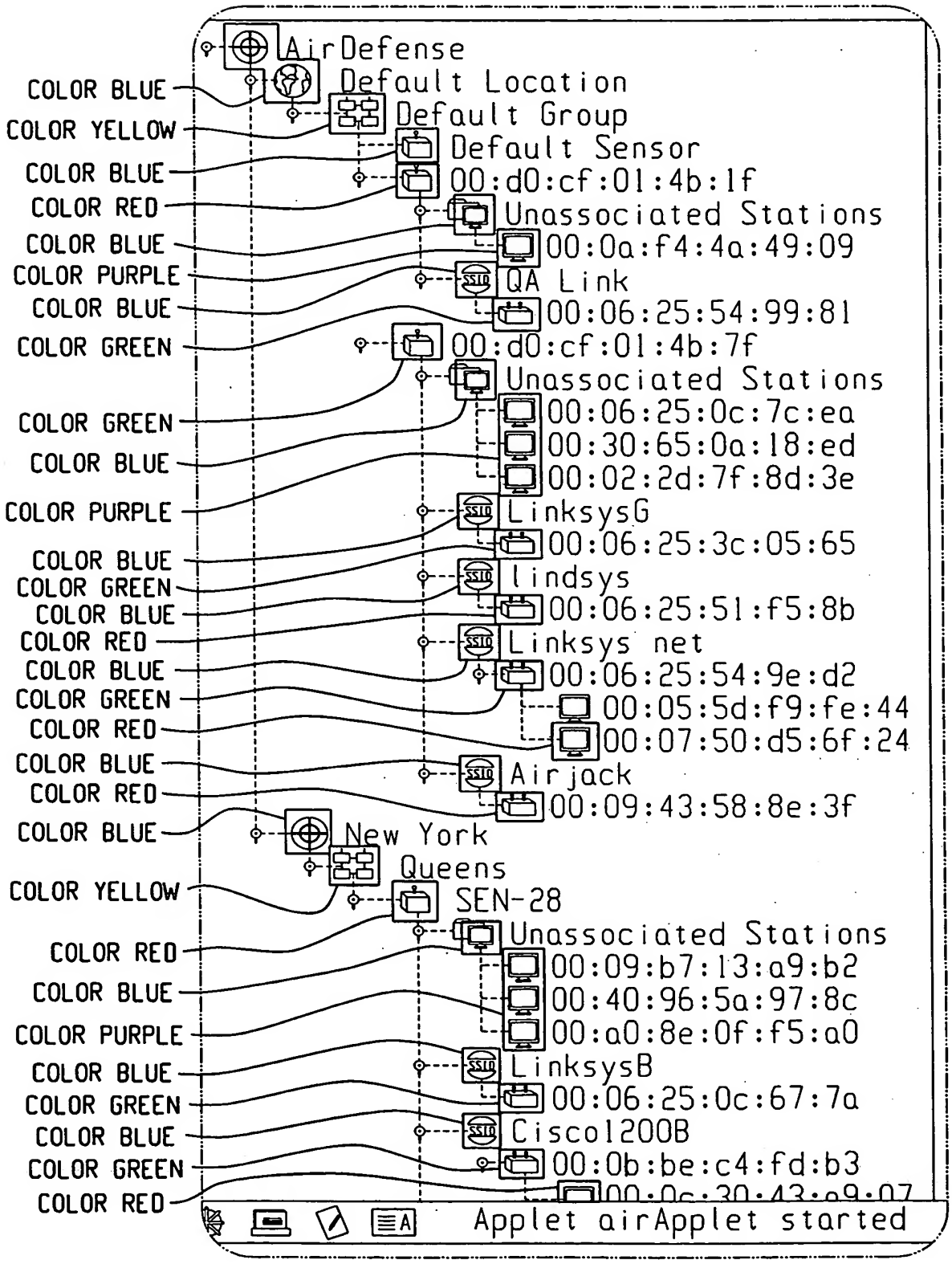

AirDefense
Default Location
Default Group
Default Sensor
00:d0:cf:01:4b:1f
Unassociated Stations
00:0a:f4:4a:49:09
QA Link
00:06:25:54:99:81
00:d0:cf:01:4b:7f
Unassociated Stations
00:06:25:0c:7c:ea
00:30:65:0a:18:ed
00:02:2d:7f:8d:3e
LinksysG
00:06:25:3c:05:65
lindsys
00:06:25:51:f5:8b
Linksys net
00:06:25:54:9e:d2
00:05:5d:f9:fe:44
00:07:50:d5:6f:24
Airjack
00:09:43:58:8e:3f
New York
Queens
SEN-28
Unassociated Stations
00:09:b7:13:a9:b2
00:40:96:5a:97:8c
00:a0:8e:0f:f5:a0
LinksysB
00:06:25:0c:67:7a
Cisco1200B
00:0b:be:c4:fd:b3
Applet airApplet started
COLOR BLUE
COLOR YELLOW
COLOR BLUE
COLOR RED
COLOR BLUE
COLOR PURPLE
COLOR BLUE
COLOR GREEN
COLOR GREEN
COLOR BLUE
COLOR PURPLE
COLOR BLUE
COLOR GREEN
COLOR BLUE
COLOR RED
COLOR BLUE
COLOR GREEN
COLOR RED
COLOR BLUE
COLOR RED
COLOR BLUE
COLOR YELLOW
COLOR RED
COLOR BLUE
COLOR PURPLE
COLOR BLUE
COLOR GREEN
COLOR BLUE
COLOR GREEN
COLOR RED

Fig. 13A1a

MATCH TO FIG. 13B2

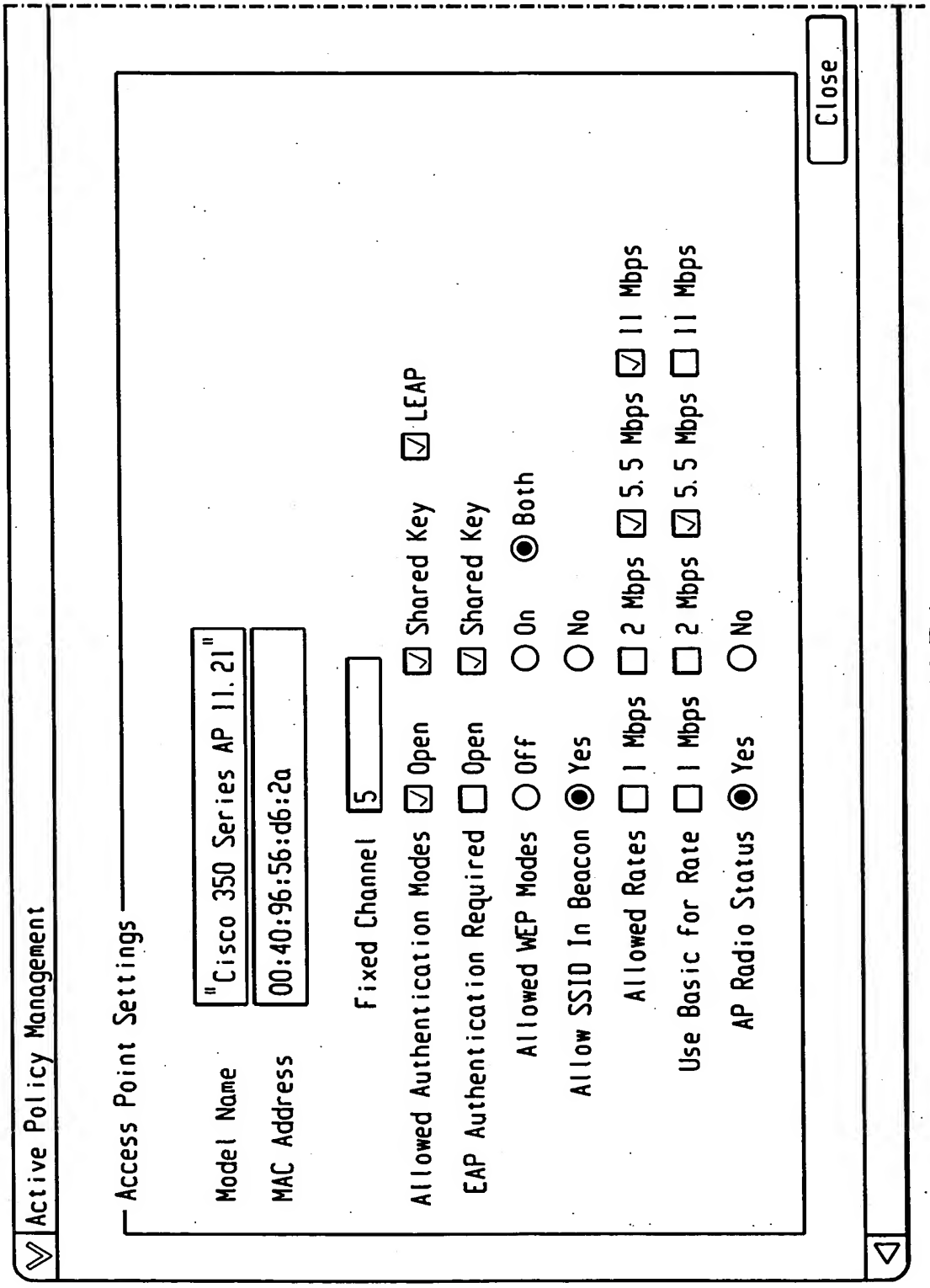
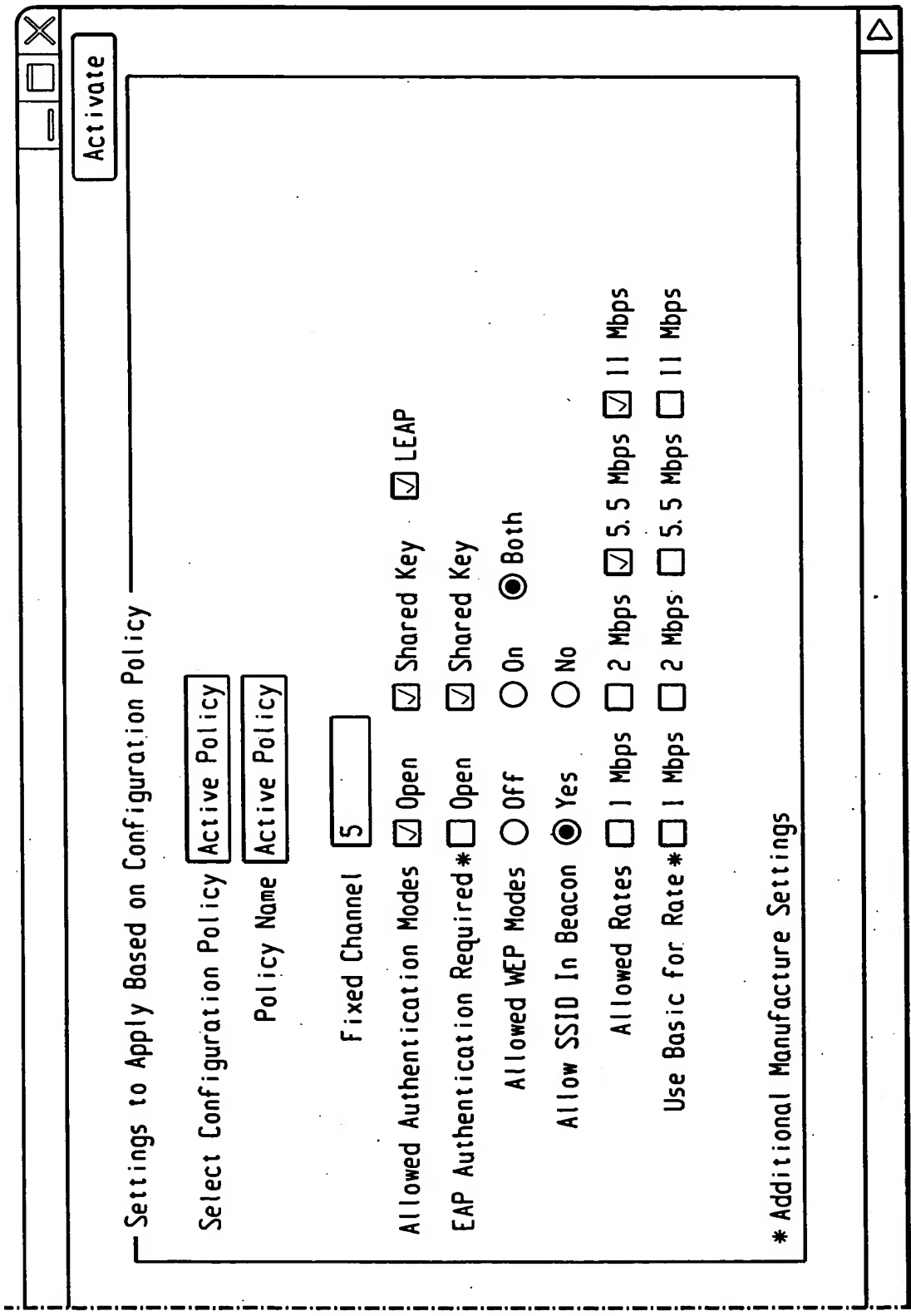


Fig. 13B1



MATCH TO FIG. 13B1

Fig. 13B2

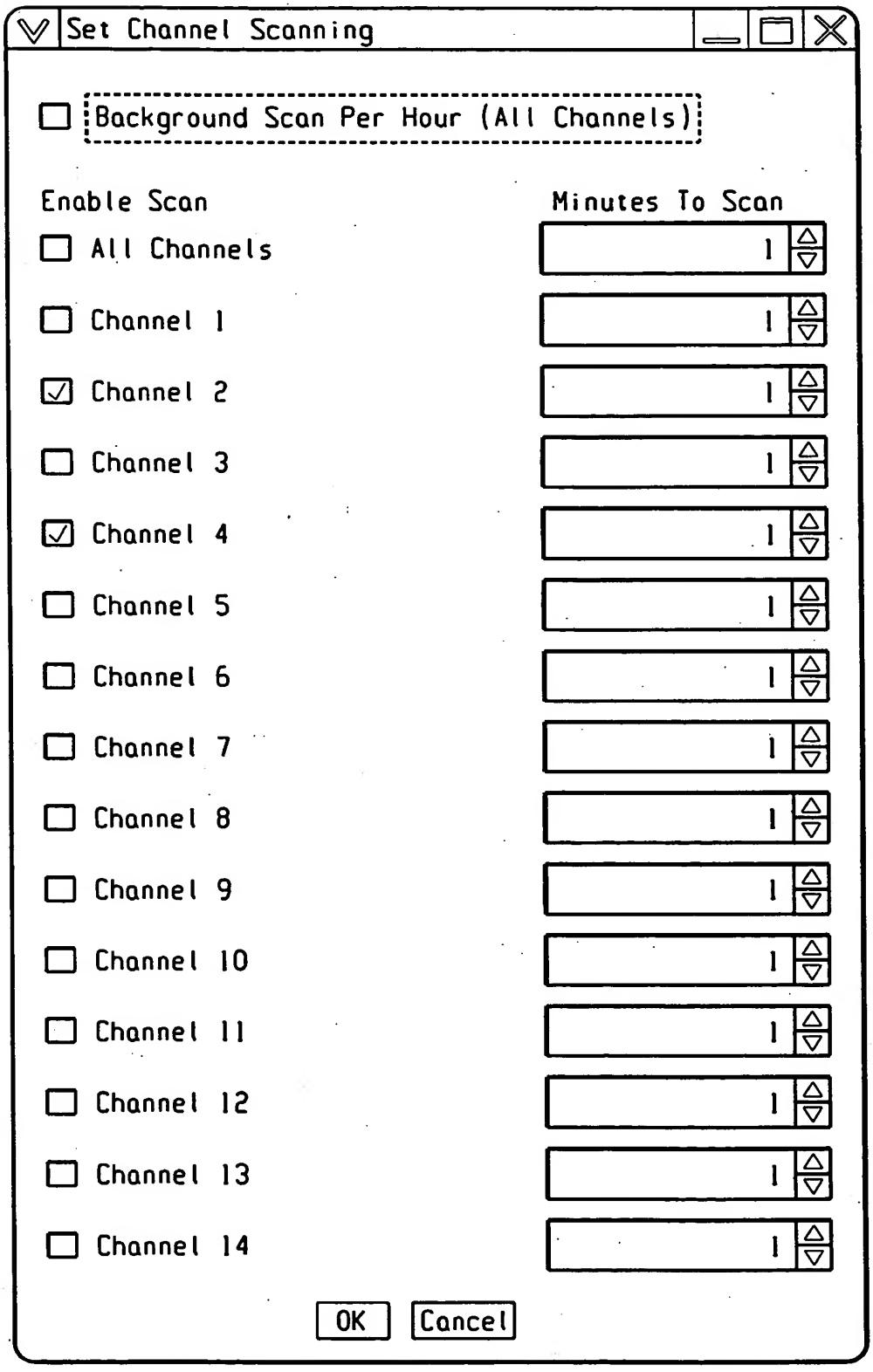

Set Channel Scanning
Background Scan Per Hour (All Channels)
Enable Scan
Minutes To Scan
All Channels
Channel 1
Channel 2
Channel 3
Channel 4
Channel 5
Channel 6
Channel 7
Channel 8
Channel 9
Channel 10
Channel 11
Channel 12
Channel 13
Channel 14
1
OK
Cancel

Fig. 14

FIG. 15

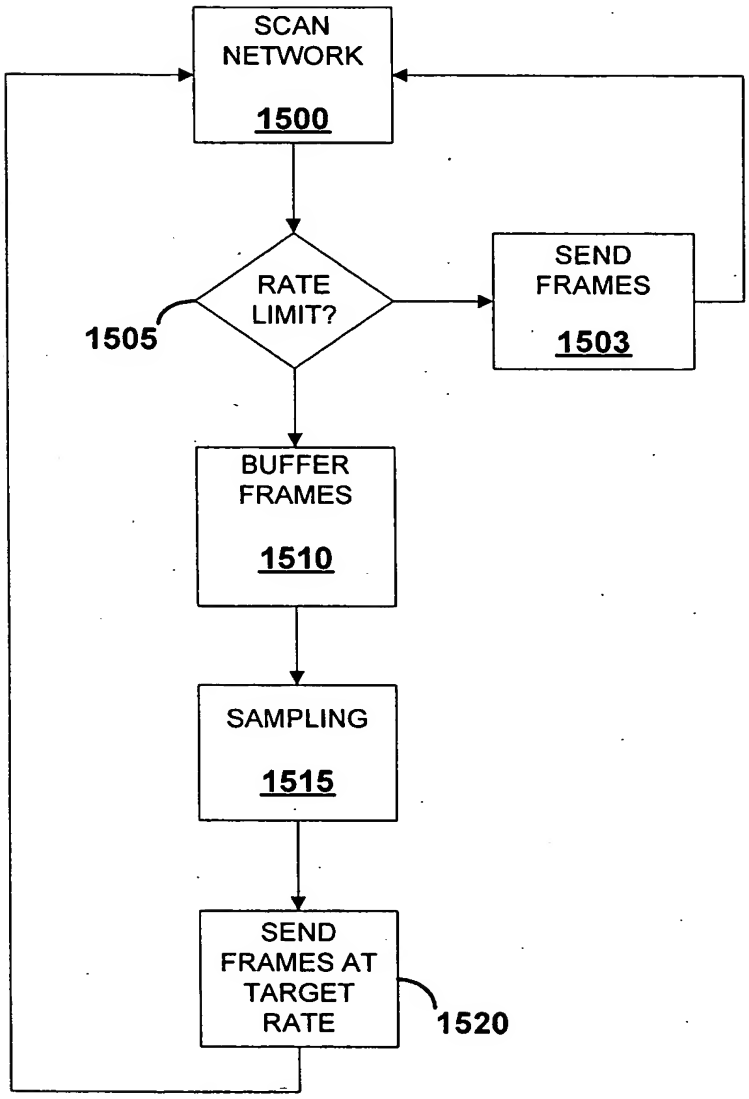

SCAN NETWORK
1500
RATE LIMIT?
1505
SEND FRAMES
1503
BUFFER FRAMES
1510
SAMPLING
1515
SEND FRAMES AT TARGET RATE
1520

FIG. 16

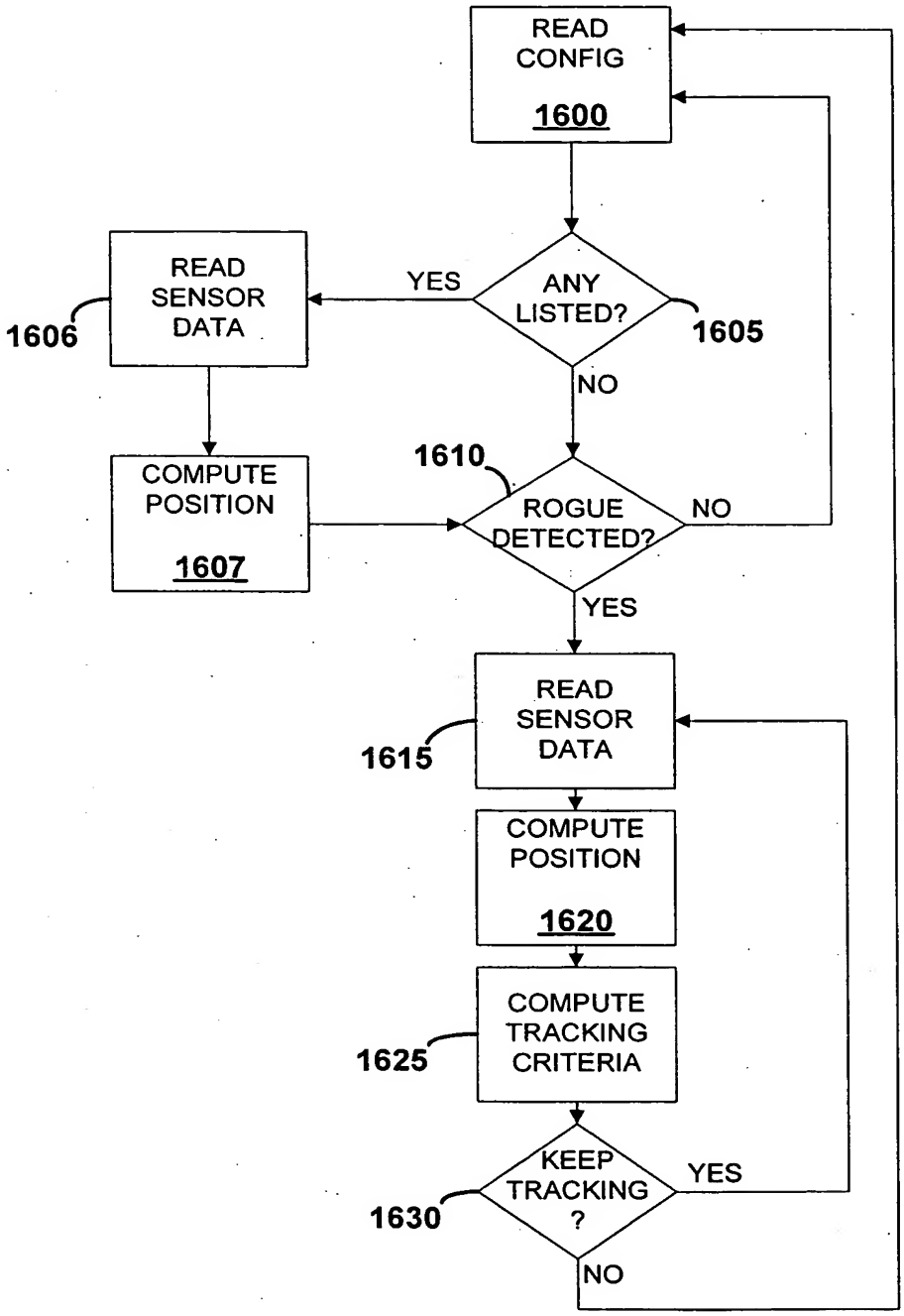

READ CONFIG
1600
ANY LISTED?
1605
YES
READ SENSOR DATA
1606
NO
COMPUTE POSITION
1607
1610
ROGUE DETECTED?
NO
YES
READ SENSOR DATA
1615
COMPUTE POSITION
1620
COMPUTE TRACKING CRITERIA
1625
KEEP TRACKING ?
1630
YES
NO

FIG. 17

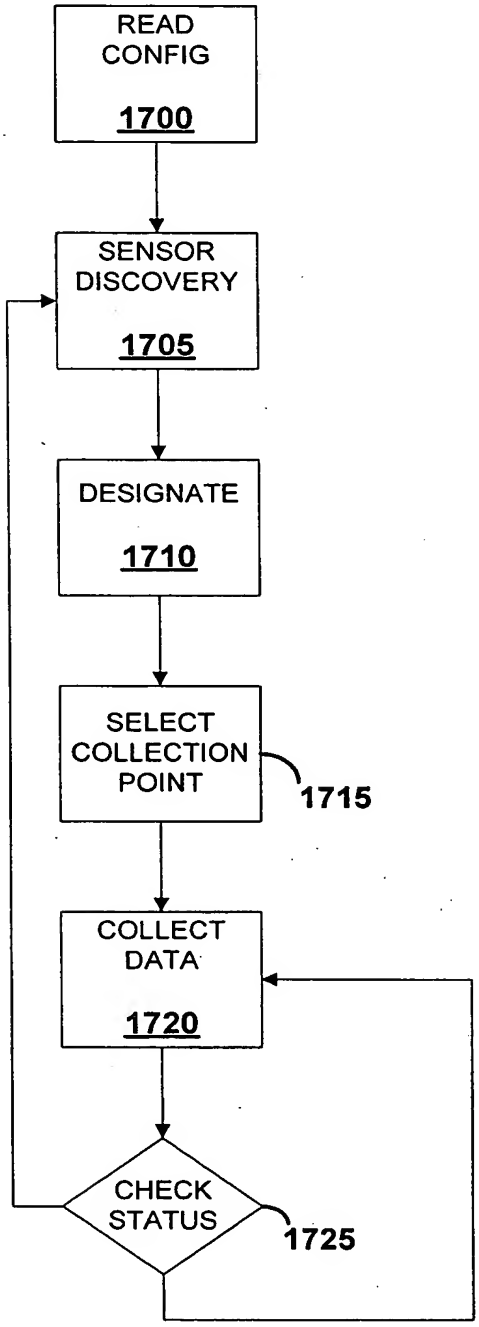

READ CONFIG
1700
SENSOR DISCOVERY
1705
DESIGNATE
1710
SELECT COLLECTION POINT
1715
COLLECT DATA
1720
CHECK STATUS
1725

FIG. 18

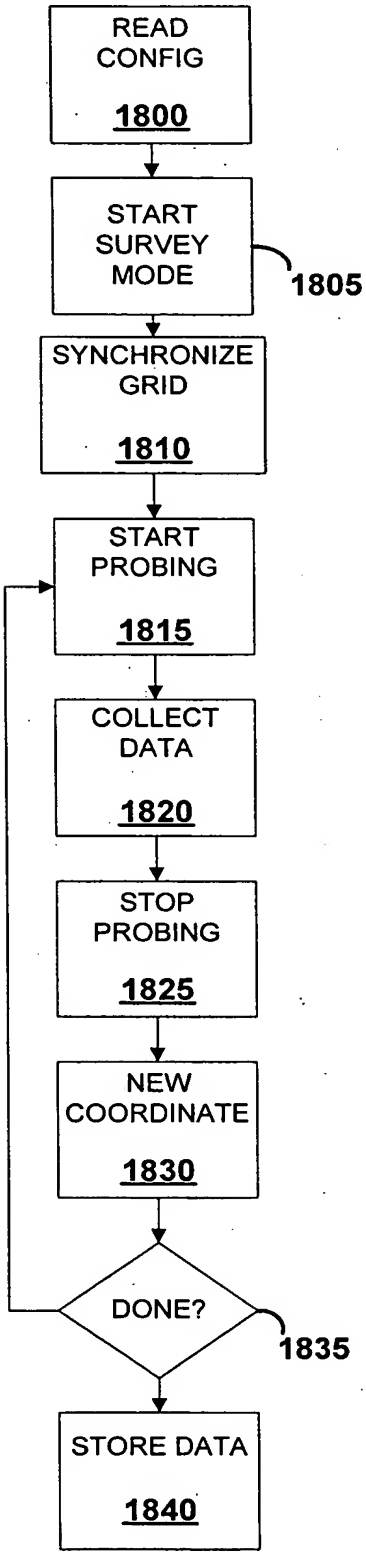
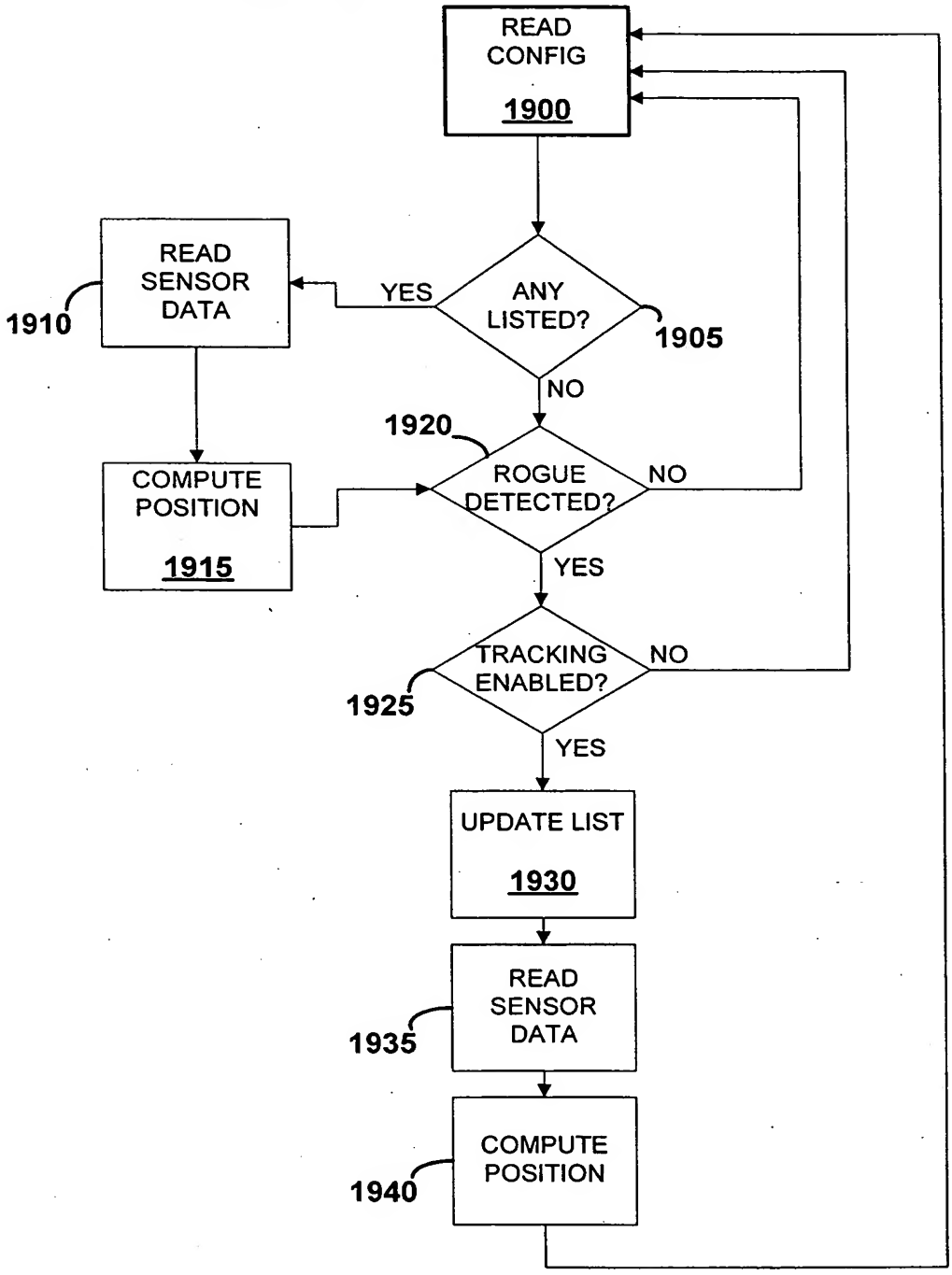

READ CONFIG
1800
START SURVEY MODE
1805
SYNCHRONIZE GRID
1810
START PROBING
1815
COLLECT DATA
1820
STOP PROBING
1825
NEW COORDINATE
1830
DONE?
1835
STORE DATA
1840

FIG. 19


READ CONFIG
1900
ANY LISTED?
1905
YES
READ SENSOR DATA
1910
NO
ROGUE DETECTED?
1920
NO
COMPUTE POSITION
1915
YES
TRACKING ENABLED?
1925
NO
YES
UPDATE LIST
1930
READ SENSOR DATA
1935
COMPUTE POSITION
1940